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Occupational HAZARDS

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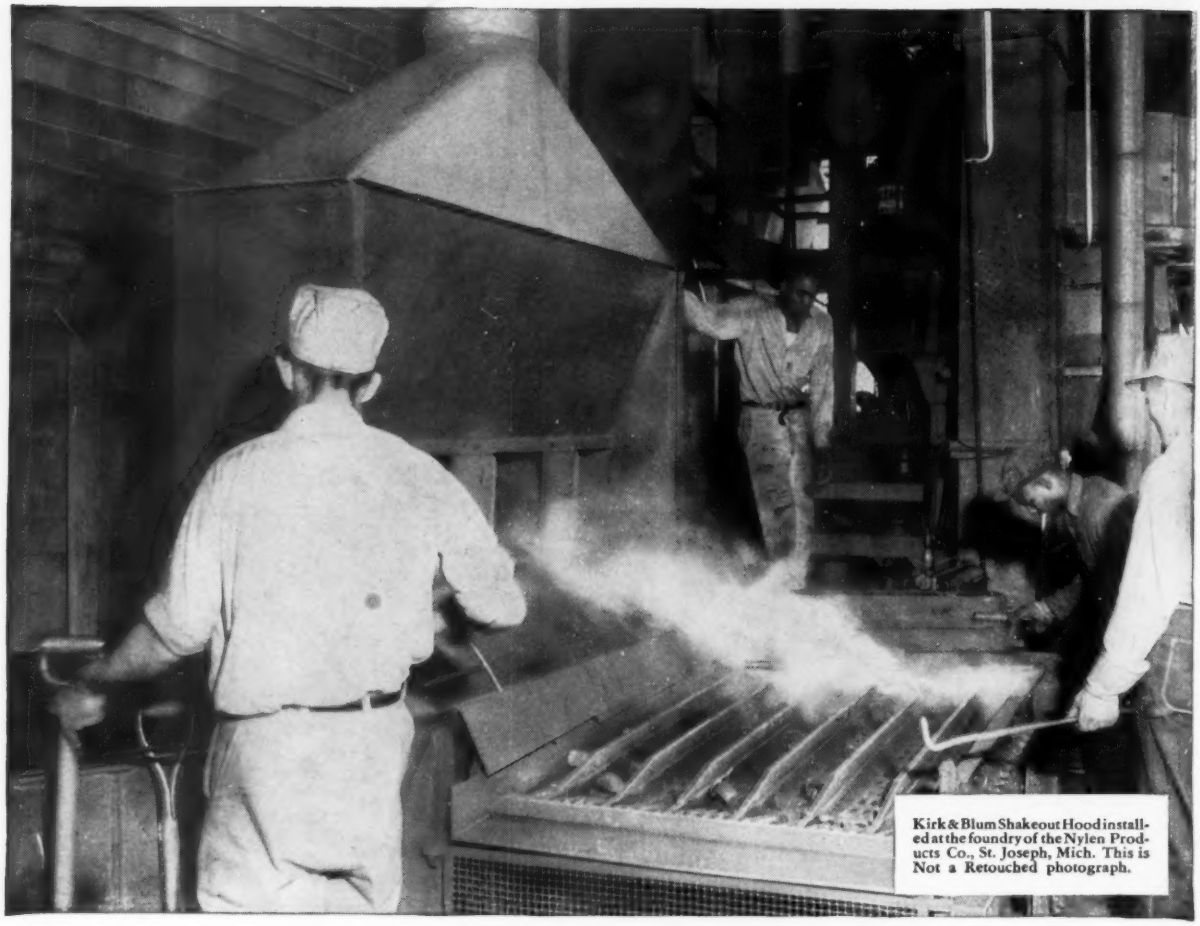
THERE'S PROFIT IN PREVENTION

JANUARY
1947

ROUTE TO
OUR PLANT
E PROTECTION
EN: FEATURE
ECTION ON
E PROTECTION
R INDUSTRY

IN THIS ISSUE: MASS X-RAYS . . . REPUBLIC DOES IT . . . PUTTING COLOR TO WORK . . . "ILLEGAL" HAZARDS . . . FIRE PROTECTION

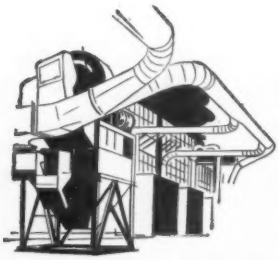


Kirk & Blum Shakeout Hood installed at the foundry of the Nylen Products Co., St. Joseph, Mich. This is Not a Retouched photograph.

KIRK & BLUM AIR ENGINEERING

...provides effective Ventilation of Shakeout

K & B Engineers determine the pipe sizes and correct location of the hood opening.



K & B Engineers select the right type of exhaust equipment to produce the desired airflow.

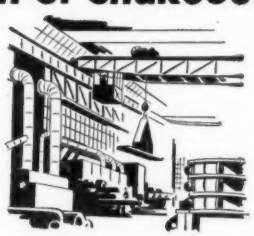
● Foundry men agree that of all dust sources, the shakeout is by far the worst and most troublesome. Without adequate control of dust and fumes at the shakeout, other forms of foundry ventilation are of little practical value.

Knowing these facts from extensive experience, Kirk & Blum have long specialized in the planning, designing, and installation of efficient and dependable systems for the control of shakeout dust and fumes. Like all K & B installations, these systems are *correctly engineered and custom-built* to fit the individual job —and guaranteed to provide *maximum efficiency at minimum operating cost.*

For complete details, including names of leading foundries utilizing our services, write us at the address below.

THE KIRK & BLUM MANUFACTURING CO., 2802 Spring Grove Ave., Cincinnati 25, Ohio.

KIRK AND BLUM



K & B Engineers design the equipment to provide for proper clearance, safety, and visibility of crane operators.

The actual installation, made under rigid engineering supervision, is carefully scheduled to assure minimum interference with foundry operations.

HD7260
.03
1
932
17

ARE YOUR WORKERS WASHING WITH *FIRE?*

Of all the precious assets your plant possesses, none is more important than the hands of your workers! And dangerous undesirables in any worker's washroom are "fiery" hand cleaners whose strong alkaline or harshly abrasive action tends to irritate or injure the skin's surface, making it more susceptible to infection.

In many instances, authorities say: "Harsh skin cleansers have frequently been found to be the actual causes of occupational dermatitis which before investigation seemed to have been caused by the chemicals manufactured or handled."

West Sulpho Hand Cleaner—a liquid skin cleanser made of sulphonated vegetable oil—is one of your best safeguards against this condition.

Neither dangerously high nor ineffectually low, Sulpho's pH is ideally neutral; its emulsive action gentle, not grinding.

An aid in cutting down costly absenteeism, Sulpho is designed to *get out* soil, grease and grime *without harming or defatting sensitive dry skin.*

Sulpho is one of hundreds of products developed by West for the promotion of effective sanitation. Consult with one of a nationwide staff of over 350 experienced West representatives.

WEST DISINFECTING Company

Products That Promote Sanitation

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BRANCHES IN PRINCIPAL CITIES OF UNITED STATES AND CANADA

CLEANSING DISINFECTANTS • INSECTICIDES • KOTEX VENDING MACHINES
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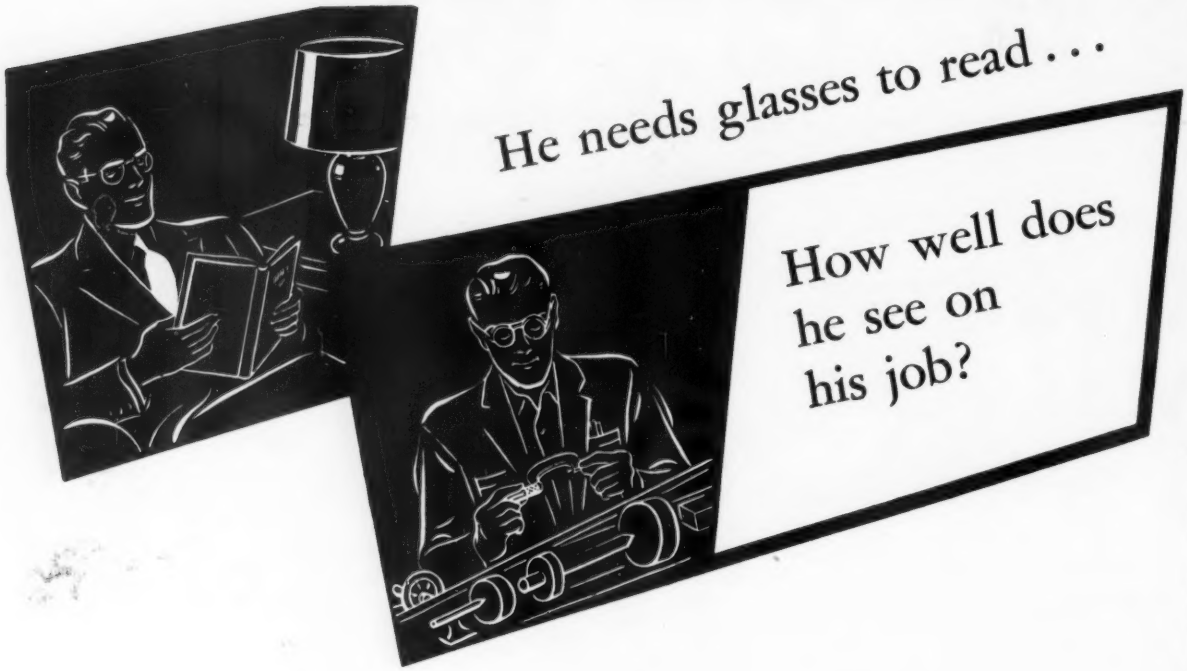


IF YOUR eye safety program is designed only to protect workers' eyes, you may be missing the *big half* of a complete visual safety program. Industrial studies show that at least half of all workers need eyesight correction. Industrial eyewear, incorporating correction professionally prescribed for the requirements of every job, prevents "I-didn't-see" accidents (and increases worker productivity.) Your Bausch & Lomb distributor offers prescription service on industrial eyewear—visual *protection* and *correction* for your workers.

SAFETY FACT-FINDING CASE HISTORY...

BEFORE Ortho-Rater Visual Performance Standards

AFTER Ortho-Rater Visual Performance Standards

40% SAVING

This is the actual record of one department of a Bausch & Lomb Industrial (Occupational) Vision Service subscriber. The feature of this service is the Ortho-Rater system of visual performance measurement and the corollary fact-finding system as a basis for visual standards. In addition to improving safety records, the Industrial Vision Service contributes to increased production, improved quality, reduced labor turnover, and lower training costs.

Write for descriptive bulletin.

BAUSCH & LOMB

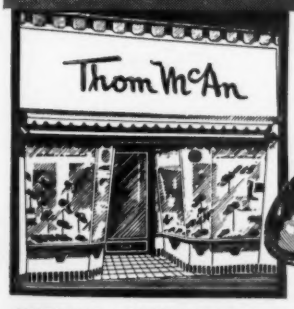
OPTICAL COMPANY ROCHESTER 2, N. Y.

One Way To Do It! — by Rube Goldberg

TO PREVENT HANDYMAN FATALITIES

AS YOU DRIVE NAIL TO HANG PICTURE, BREEZE FROM HAMMER **(A)** TURNS PINWHEEL **(B)** CAUSING HAND **(C)** TO NUDGE TRAINED PARROT **(D)** WHO SHOUTS HOME ADDRESS INTO SPEAKER-SYSTEM **(E)** WHICH GOES DIRECT TO CITY HOSPITAL—BY TIME YOU HAVE HIT THUMB **(F)**, CHOKED ON PICTURE WIRE **(G)**, FALLEN OFF LADDER **(H)** TO CUT YOURSELF ON EXPENSIVE VASE **(I)** DOCTOR **(J)** ARRIVES TO SAVE YOUR LIFE.

MAKE THIS STORE YOUR SAFETY SHOE DEPT.



More than 500 stores in over 300 cities.

SAFETY SHOE DIVISION
25 W. 43 ST., NEW YORK 18, N. Y.

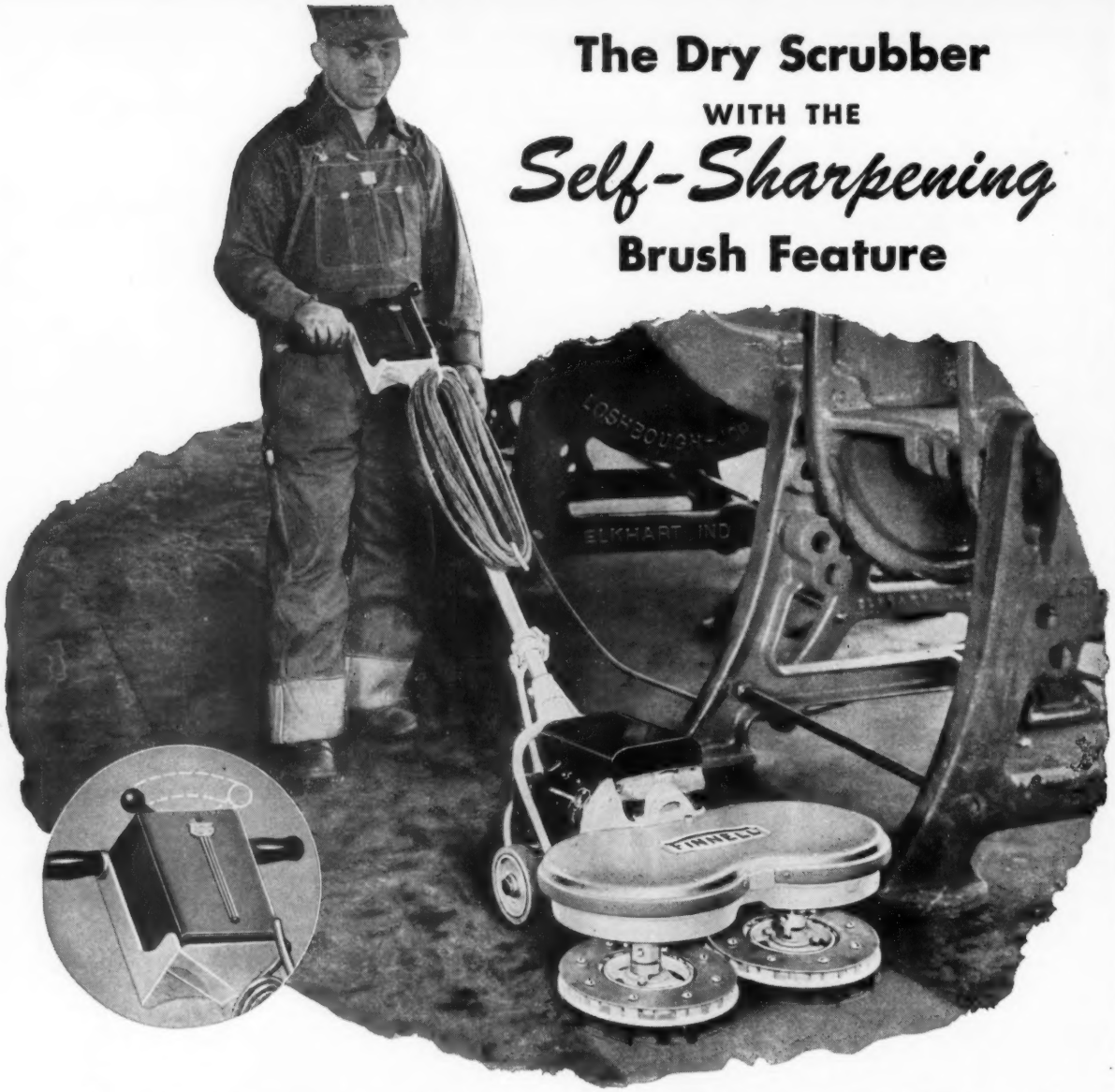
ONE WAY to approach the foot safety problem in your plant is to provide Safety Shoes of some brand that your men don't know—or perhaps don't like.

THE EASY WAY is to select Thom McAns, "the Safety Shoes that workers wear WILLINGLY"—because they already know and trust the Thom McAn name.*

THE EASIEST WAY OF ALL—"LET Thom DO IT"
Let us stock our Safety Shoes for you in our own Thom McAn retail stores, fit them with our own trained fitters, without cost or obligation on your part. You, freed of "shoe store problems," can concentrate on more important things, make yourself a more valuable man. Proof? Details? Write for them—today.

*MORE MEN buy their shoes from Thom McAn than from ANY OTHER shoe store organization IN AMERICA

The Dry Scrubber
WITH THE
Self-Sharpening
Brush Feature



Just Flip the Switch That reverses the motion of the brushes of the *Finnell* Dry Scrubber and re-sharpens them automatically! Eliminates the need for frequent changing of brushes by hand in order to maintain a good cutting edge. Automatic reversal of the brushes also helps keep them functioning efficiently by ejecting sticky substances that may otherwise tend to clog.

This heavy duty *Finnell* cleans grease-caked floors in about *one-tenth* the man-hour time required when hand-spudding, and is far more thorough. Floating brush rings enable the two powerful scarifying brushes to get into indentations and grooves that rigid coupling brushes pass over and miss. And the low construction makes it easy to clean around and beneath equipment. The machine is adaptable to wet scrubbing, steel-wooling, waxing, and polishing. Ruggedly constructed, assuring long, trouble-free service. Has heavy duty G. E. Motor, oversize Timken Roller Bearings, special bronze worm gears—a quality product throughout, reflecting *Finnell's* four decades of specialized experience in the manufacture of floor-maintenance equipment.

For free floor survey, consultation, or literature, phone or write nearest *Finnell* branch or Finnell System, Inc., 3501 East St., Elkhart, Ind. Canadian Office: Ottawa, Ont.

FINNELL SYSTEM, INC.
Pioneers and Specialists in
FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

Occupational HAZARDS

VOLUME 9 • NO. 3

"There's Profit in Prevention"

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By SUBSCRIPTION, one year, $2.00. Single copies, 25 cents. Canada: One year $3.00. Foreign: One year, $4.00.

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COVER: Wintertime brings closed windows and stuffy air to most of the country's industrial plants—but the "stuffiness" is not the greatest hazard, especially in steel mills where gas leaks must be tested for continuously to make sure that the poor ventilation does not intensify fire hazards or toxic conditions for workmen. The Carnegie-Illinois tester shown wears an oxygen mask for his own protection.

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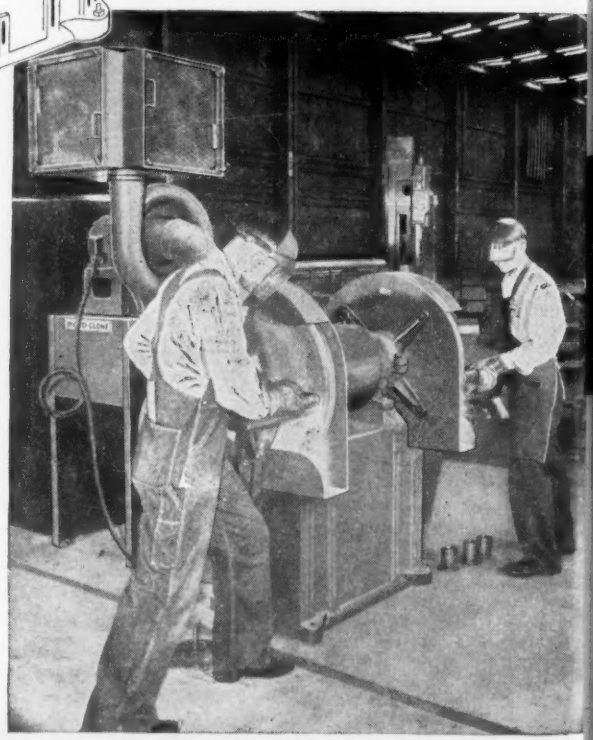
Best Possible DUST CONTROL FOR *all* GRINDING OPERATIONS

ROTO-CLONE OPERATION IS POSITIVE AND TROUBLE-FREE

The proven dynamic principle employed by the Roto-Clone results in a higher percentage of collection of the very small particles and its efficiency is unaffected by changes in air volume or operating speed. Its construction is sturdy and resists the abrasive action of metal dusts, thus assuring long life and freedom from servicing. Send for descriptive Bulletin No. 272.

AMERICAN AIR FILTER CO., INC.
Incorporated
366 CENTRAL AVE., LOUISVILLE 8, KENTUCKY
In Canada: Darling Brothers, Ltd., Montreal, P. Q.



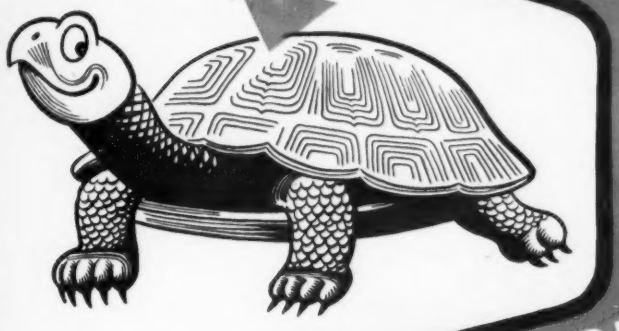
Viscous filter aftercleaners mounted on the Roto-Clone exhaust allow cleaned air to be recirculated to the workroom.

ROTO-CLONE

FOR ALL GRINDING OPERATIONS

HY-TEST *Safety Shoes*

PROTECTION

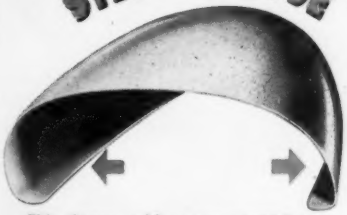


WHERE NEEDED

Stock Number H721-4—all purpose safety shoe with Slant-Eze Top, newest Hy-Test comfort feature.

. Insure Workers Feet In Sure Protection

ANCHOR FLANGE STEEL BOX TOE



This flange adds extra strength to the steel arch's sidewall. Anchored between insole and outsole, it also serves to resist shifting and tilting when toe is struck at an angle.

Nature wisely provides the slow-moving turtle with a life-protecting shell. And just as wisely, the makers of Hy-Test Safety Shoes provide a shell of steel in Hy-Test Shoes to give *protection where needed.* This Anchor-Flange Steel Box Toe defies falling objects and other toe-injuring hazards. It is scientifically arched to take the blows . . . specially anchored to hold firm without shifting or tilting. This sturdy shell of steel is so smoothly patterned into Hy-Test's trim, neat lines you hardly know it's there.

Yet, like other outstanding features, it helps distinguish these shoes to make them preferred by more workers than any other safety shoe in America. Husky, pliant leathers, *Slant-eze* tops for ankle freedom, and quality workmanship throughout assure longer wear, extra comfort, and neat appearance in the safety shoe that gives *protection where needed.* Would you like to know how Hy-Test's plan can bring these shoes to workers in your plant? Just drop us a line.

HY-TEST SAFETY SHOES

HY-TEST *Safety Shoes*

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST DIVISION • INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO.
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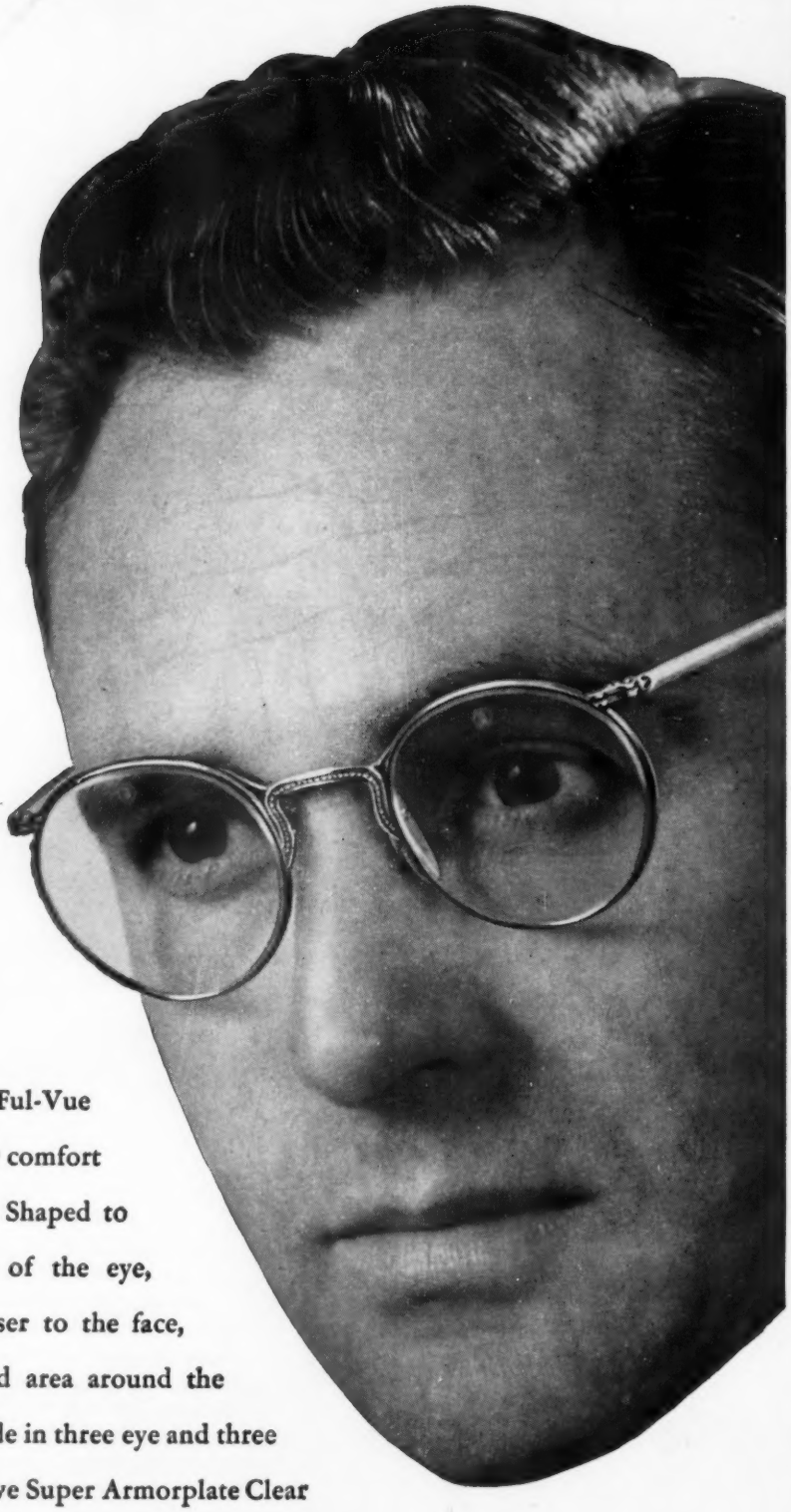


A-O Ful-Vue
Safety Goggles
for Good Looking
Eye Protection

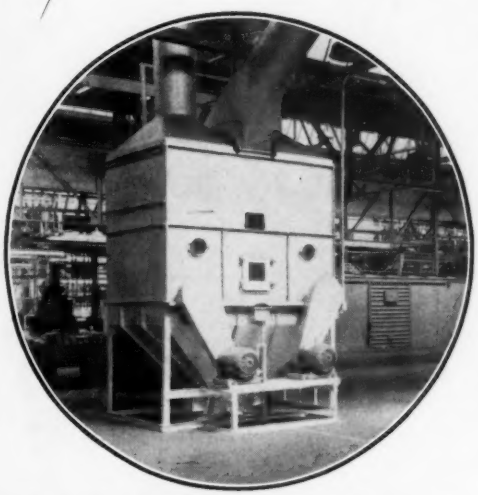
Workers like A-O Ful-Vue Safety Goggles for their comfort and good appearance. Shaped to conform to the orbit of the eye, lenses are brought closer to the face, leaving no unprotected area around the bridge of the nose. Made in three eye and three bridge sizes, with 6-curve Super Armorplate Clear or Calobar lenses—with or without side shields. The nearest A-O Safety Representative can supply you.

American Optical COMPANY *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS. OFFICES IN PRINCIPAL CITIES

LIKE A GIANT VACUUM CLEANER

Schmieg CENTRI MERGE



CENTRI-MERGE Collection Units are available in capacities to handle any air cleaning job—small or large. May be installed singly or in batteries, depending upon volume of air to be handled.

Completely CLEARS YOUR PLANT OF DANGEROUS DUST AND FUMES

Safeguard of employees' health—*Security* against fire—explosion—abrasion and corrosion of machines and manufactured products.

That's CENTRI-MERGE in action—in foundries—machine shops—chemical laboratories—plastic plants—and the many other industries where dust and fumes are a menace to workmen and work.

AUTOMATICALLY—by suction—contaminated air is cleared from working areas—carried on a powerful air stream through a descending curtain of water into the CENTRI-MERGE Collection Unit, where all foreign matter literally is scrubbed and pounded out in a seething tornado of water.

Air goes out the exhaust. Dust and dirt are flooded into a sludge tank beneath the Unit—*under water*—out of circulation for good.

Let us show you the safe, thorough and economical job of elimination CENTRI-MERGE is doing *right now* in scores of plants similar to your own—*why* it will do the same for you.

THE *best* AIR PURGE *is* CENTRI MERGE

Schmieg INDUSTRIES INC.

Engineers & Manufacturers

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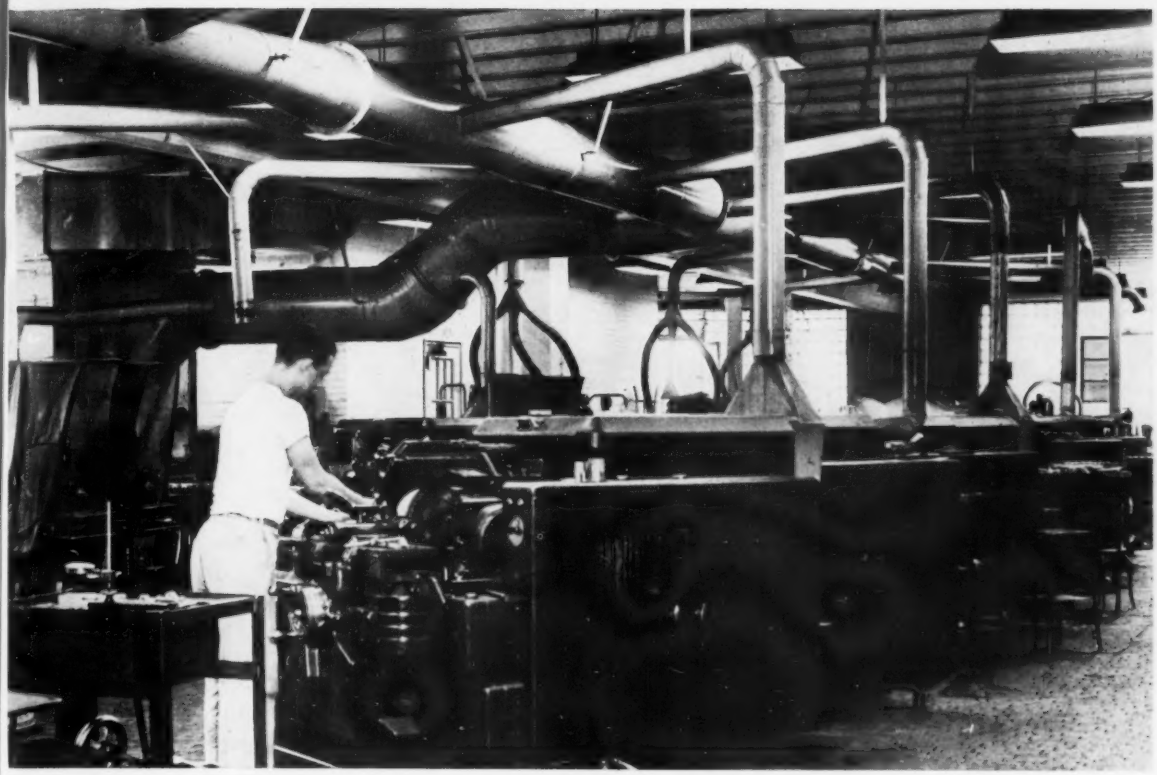
the doctor was dumbfounded!

We're proud of this shoe.
A 35,500 lb. stationary engine fell on it.
The 17½ ton impact cracked even
the *Lockrim steel toe box. But the doctor who cut
the shoe open was amazed to find no injury except
a bruise on the workman's big toe nail. This
rugged protection is built into every pair of Lehighs.
Dropped tools and other run-of-mill impacts won't
even dent 'em. And you can get one pair or
hundreds, whenever you need them.
Write today for a catalog and prices.

LEHIGH SAFETY SHOE CO., INC. · ALLENTOWN, PA.



AN OIL FUMES COLLECTING system, shown in overall view, installed on thread grinding machines at the National Acme Company. Piping leads to precipitation unit at extreme left side of room. (Courtesy Electrical Production.)

Systematic Removal of Oil Fumes

FROM A GRINDING DEPARTMENT

By WILLIAM MOORE
Superintendent
Threading Tools Division,
The National Acme Co.
Cleveland, O.

A method of collecting oil fumes, being used in the thread-grinding department of the National Acme Company, has proved its value in a number of ways.

Prior to the installation, the vision of employes who were wearing glasses was frequently obscured by a coating of oil which settled from the air.

It is also a known fact that uncontrolled oil fumes cause costly damages to electrical equipment, resulting in lost production. An accumulation of oil on walls and buildings creates a fire hazard; and explosions sometimes results where a high concentration of oil is suspended in the air.

In addition, skin diseases may be caused by oil.

The system employed in our plant involves the wet precipitation method for the removal of oil and other particles from the air.

As seen in the photograph at the top of this page, piping is connected to the properly designed hoods located over the machinery which creates fumes. These pipes lead to a huge collecting unit in one corner of the department.

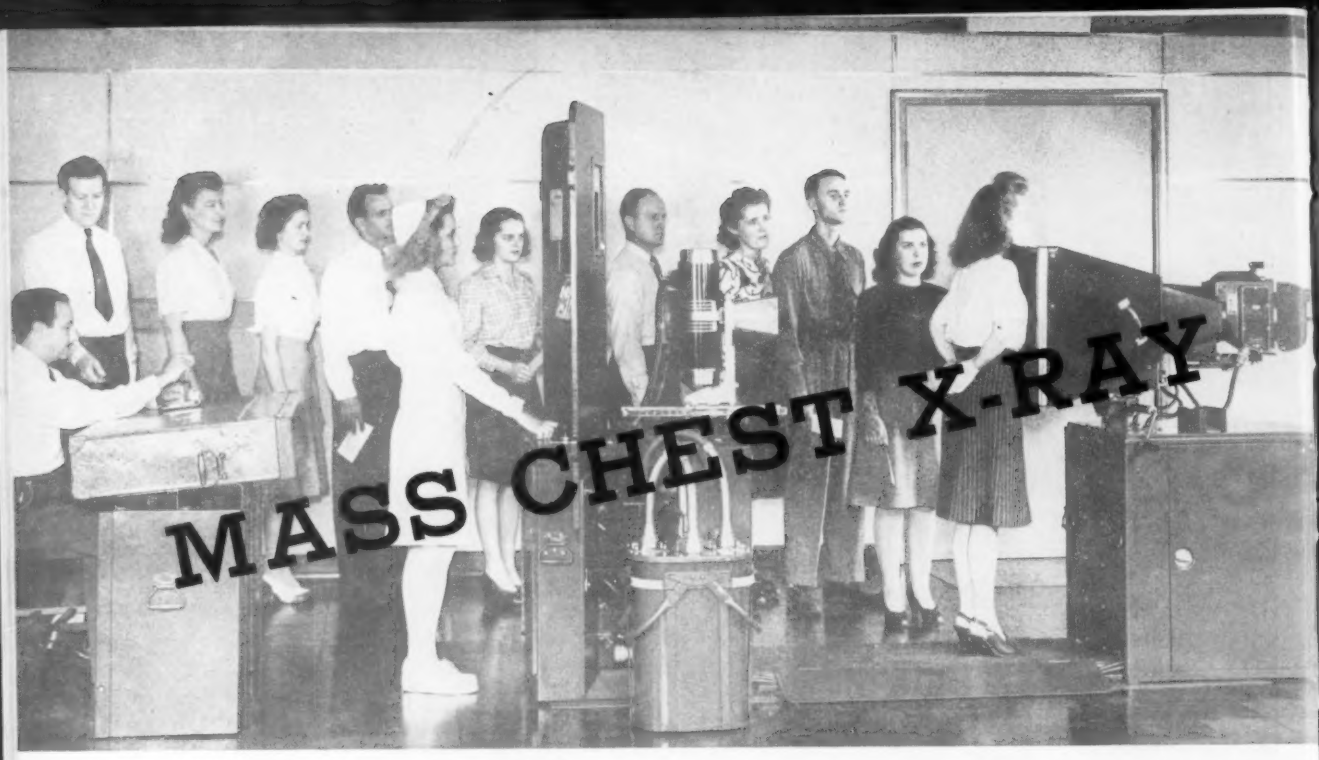
The hoods are designed to fit over the machines. They remove fumes with a minimum cubic feet of suction per minute.

Operational adjustments can be made to the production machinery because of the manner in which the hoods are designed.

The piping from the hoods is soldered to prevent leakage of any vapors which may condense in the exhaust piping. An air velocity of approximately 4000 cubic feet per minute is maintained in the main piping, and approximately 5000 cubic feet per minute in the vertical piping which connects to the hoods over the machines.

Our installation is a pump-type unit. The collector has a capacity of 12,000 cubic feet per minute. A three horsepower motor circulates 450 gallons of water per minute within the collector unit.

A cleaning compound is added to the water, causing a heavy foam. The surfaces of the bubbles remove the oil fumes and other particles from the air.



MASS CHEST X-RAY

By J. J. ELWOOD
Safety Director
Thompson Products Company

Results of Thompson Products' continuing mass chest X-ray program offer proof that when management recognizes the causes contributing to heavy absenteeism, it can institute a recognized program to reveal previously undisclosed cases of tuberculosis which often result as the aftermath of ordinary respiratory ailments.

RECENT demonstrations at Thompson Products Company, Cleveland, Ohio, airplane and automobile parts manufacturers, have already shown that systematic cooperation of industry and the resources of local officials and private health agencies in the community can serve as a means of detecting tuberculosis through the use of a comparatively new technique—mass chest X-ray.

It is common knowledge that approximately 90% of days lost in industry through illness can be blamed on colds, influenza, and similar infections, and that the breakdown of bodily resistance through minor respiratory ailments gives rise to the incidence of tuberculosis. It is also a generally accepted fact that periodic examination is the first step toward detecting the menace of tuberculosis.

Doubtlessly, several thought-provoking questions confronted the officials concerned with the health and welfare of our employees in connection with this problem. Chief among them were:

"How serious is the problem in our company?"

"What can be done about protection against and detection of tuberculosis among our workers?"

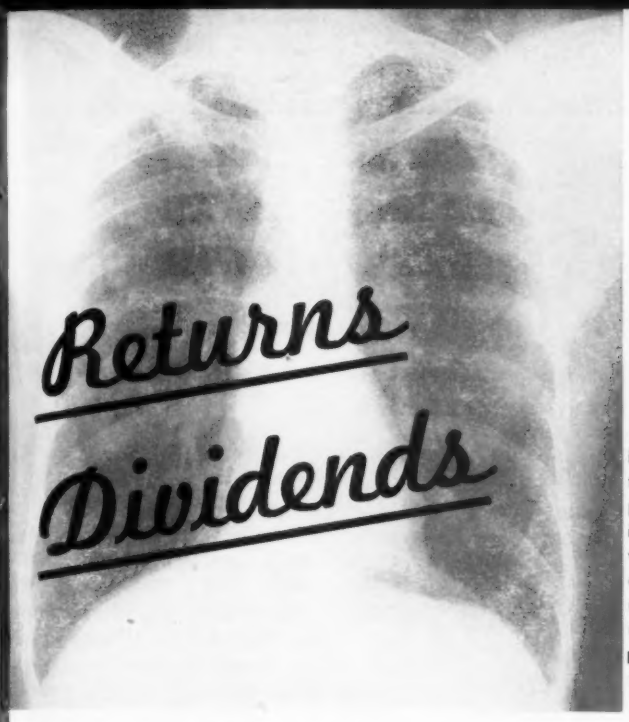
"How can we institute an intelligent program to reveal previously undisclosed cases among present and new employees?"

Each of these pertinent questions had numerous implications to us but only one conclusive answer could be applied toward the solution of these problems—free, mass chest X-ray.

Thus, the mass chest X-ray or survey of employees at Thompson Products Main Plaint was born of a simple premise. By sustaining health, the production level could be maintained or increased. To achieve this we had to present a health program aimed at preventing days lost

The mobile type bus X-ray unit, available to smaller industrial plants, examines on the average of 50 persons an hour often covering several plants in the immediate vicinity during the course of a day.

Returns Dividends



Public health service technicians plus teamwork of company clerks handle incoming lines of workers for mass chest X-ray. Individuals are put through machine at the approximate rate of two minutes per person.

through personal illness. This is a routine and accepted fact based on common sense—and an economy affecting both management and workers alike.

Briefly, the mass chest X-ray program operates in a simple manner. In our city, it was the facility of the Tuberculosis Controller which made these health checkups possible. (In the beginning, however, it was the U. S. Public Health Service which helped to organize the industrial survey program and after it was successfully launched, the entire program was turned over to the local agencies.)

The following stipulations were essential in order to assure acceptance on the part of employees and their labor organizations:

1. Examinations in all cases were *voluntary* on the part of each worker.
2. Reports on each X-ray picture were held completely confidential.
3. Findings were *not* reported to management so that no records could be made which would involve work layoffs.
4. If diagnosis revealed questionably active tuberculosis, the patient was followed by his private physician or one of the public health clinics.

As a company which pioneered in mass chest X-ray since 1943, Thompson Products now has the procedure well systematized. In a little less than two weeks time, over 6000 men and women were put through the X-ray machine. The successful handling of these large numbers of workers in that short space of time was due to two things. A pre-selling campaign to the workers under the experienced guidance of our public relations and personnel experts, and the enthusiastic and unflagging efforts of the public health doctor and trained technicians in charge of the machine.

Thompson Products Company followed the so-called "flow sytem" whereby each worker left his machine or workbench, was registered, X-rayed, and back at work in an elapsed period of only six to eight minutes of company time.

With the greatest majority of workers there was obvious pride among those who said, "I've had mine, have you had yours?" In fact so popular has proved the service that at the most recent resurvey this past September, over 90% of the Main Plant employees volunteered for the examination believing it to be an invaluable source of additional health protection.

From recently published United States Public Health reports, findings at the Thompson Products Company revealed that where mass chest X-ray was used to expose tuberculosis incidence, certain effective conclusions were brought to light.

1. That a relatively small number of persons diagnosed as tubercular in the first survey remained on plant employment lists.
2. That new cases of tuberculosis showed up in the period of a year between examinations.
3. That one year was a favorable period of time to be allowed between surveys.
4. That job rehabilitation of inactive cases could be accomplished confidentially within the plant, without embarrassment to the worker.
5. That preplacement examinations given to new employees would afford more adequate protection to others since active cases were revealed in newly employed groups.
6. That the X-ray survey revealed other significant pathological symptoms in the chest area, including the presence of silicosis, lesions of the heart, diaphragm or pleura, and other pulmonary complications.
7. That there is for management and workers a dollar and cents factor in the use of the X-ray survey. Company human relations profit in taking preventive measures by this investment of time.

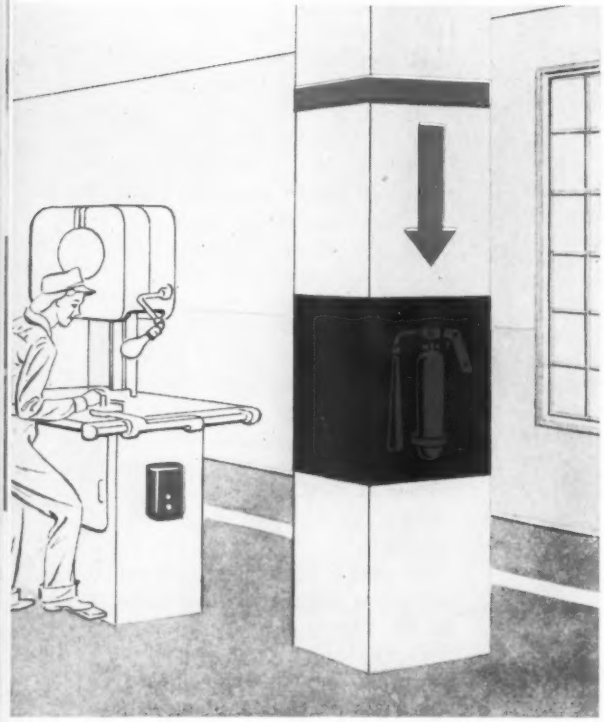
Your local public health service has answers to questions concerning these problems in your plant, too. Avail yourself of their services. The results obtained at Thompson Products Company are supported by increasingly successful functioning of the mass chest survey elsewhere. Unprecedented demands for and acceptance of mass X-ray definitely assist industry in increasing health and in cutting down the bogey of absenteeism.

Mass chest X-ray findings are carefully read and where the pictures reveal any suspicious condition of the lungs, the individual so concerned is advised privately and confidentially.

It is generally known that color in itself when properly used can convey a mess touch," "danger ahead" and many other warnings. But color has a far greater value signals when used properly in a plant.

YOU CAN PUT *Color* TO WORK

By
JAMES A. MEACHAM
The Sherwin-Williams Co.



Fire equipment is easily identified by all employees when a red band is painted around the column on which the extinguisher hangs and a vertical arrow in red with the point down. The arrow should be visible from all points in the room over the top of the machines. Red on machine turn-off box calls attention to point where machine can be stopped in emergency.

ALERT industrialists are now burning the midnight oils planning new and better ways to keep costs down, production up, and books balanced. In this crazy heyday of rising prices and rising costs, every factor which will improve productivity of individual workers is now being given careful consideration. That's why each day an increasingly large number of plant owners and managers are investigating the ways color can be of service to them.

The mere painting of a plant in an approved color harmony, such as any one of the 17 recommended by the Sherwin-Williams Co., may in itself materially reduce the chance for accidents. These color harmonies, scientifically devised, are not only restful to the eyes, but stimulate alertness and watchfulness among the employees. Case histories prove they are a factor in keeping plant efficiency high during those critical hours just before lunch and late in the afternoon when production has a tendency to slump and when carelessness is usually a factor in most accidents.

Make Hazards Visible

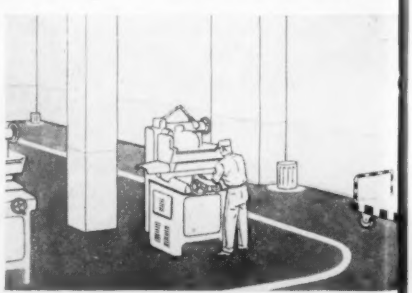
Maximum efficiency, worker morale and safety are usually achieved when the plant is carefully painted to please the employees and to make every hazard easily visible. We have found from experience that color harmony must be selected to be in harmony with the employees' tastes, rather than from broad general classifications of what constitutes good color planning. The range of acceptable colors from a standpoint of visibility and light reflection is broad enough to make possible color selection which fits into the accepted tastes of most employees.

All color engineers agree green should be used to identify first aid and other safety equipment. The yellow and black stripes on the door indicate an overhead obstruction.

But the problem of selecting color does not end there. Into the color harmony chosen must be blended the "warning signals" which are so essential to safety. It is on this point that many color engineers have widely divergent views. One recommended color warning system calls for using red on fire protection only. This includes fire hose, fire extinguishers, alarm stations and hydrants. The other danger spots in the plant are painted either yellow or orange. Yellow, the most visible color in the spectrum, is used to mark trucking equipment, conveyors, aisles at hazard points, platform edges and pits, railings, protruding parts, curbings, floor level changes, and chain hoist blocks. Orange, another highly visible and advancing color, is used to mark parts of machines or equipment that might cut, crush or electrocute: interior surfaces of fuse and power boxes, machinery guards, pulleys, gears, cutting devices and electric switches.

ASA Adds Red Uses

The American Standards Association Code, recently adopted, expands the use of red to include danger points, emergency buttons and bars for stopping machinery. Yellow is used as a caution signal and to mark hazards where workmen might strike against or stumble over, such as columns, platform edges, crane hooks, etc. Orange is an optional color in this Code for hazardous marking.



For Morale — For Safety

All color engineers agree that green should be used to identify safety equipment, such as, first aid equipment, dispensaries, medicine cabinets, respirators, stretchers and surgical wagons.

One of the great problems of the color engineer has been to fit all of these warning and safety colors into a color harmony scheme in such a way that they convey their message easily and immediately and still do not inhibit the overall pleasant effect created by the color harmony. For years ceiling pipes in many plants were painted red. This gave an overhanging striped effect which distracted the employee's attention. Many engineers say the red served no useful purpose and now they are recommending that the pipes be painted the same color as the ceiling. Only the sprinklers, they feel, should be painted red.

In keeping with this plan for maximum efficiency of both the color harmony and warning signals, Sherwin-Williams engineers believe that strong colors, such as red, should be restricted to those places that are extremely hazardous, lest the significance of the danger signal be lost through use at too many places which are only mildly hazardous. They would rather see three red signals in a department than 300.

From discussion with superintendents and management of a great many plants, our engineers conclude that the following are practical uses of color for safety.

1. Identification of fire extinguisher locations by a red band around the column on which the extinguisher hangs and possibly a red arrow vertically on the column with the point down, the arrow being in a position visible from all points in the room over the tops of the machines.

2. Red against a white background at the first floor location of the sprinkler riser valve which shuts off sprinkler water to prevent further damage after the fire is out.

3. We find it generally agreed that the common practice of identifying sprinkler piping on the ceiling with red does *not* serve a useful function. Piping should be the same color as ceiling.

4. Zone marking bands on the floor in yellow or white to identify trucking aisles are very practical. Workmen keep the aisles free and the operators of the moving equipment, like motorists on the highway, are strongly influenced to keep within the prescribed bounds.

5. The use of red to identify electrical starting buttons and switch boxes on machines calls attention to the point from which the machinery can be stopped in case of emergency.

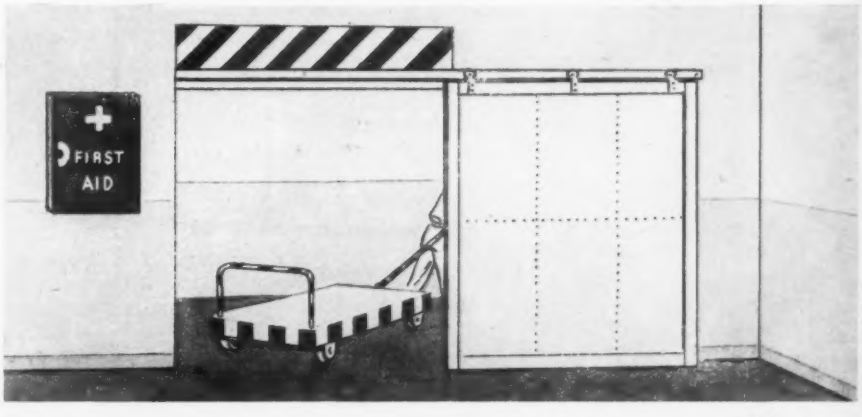
6. Attention may be directed to points of extreme hazard by painting them with red or orange, bearing in mind the thought brought out previously that if too many points are identified with the danger color, much of the significance is lost. Furthermore, in our opinion, where extreme hazard is involved the area should be protected by guards rather than relying on color schemes.

Color Conveys Messages

In conclusion we might say color has a dual safety job to perform for industry. First, and foremost it must be so used that it conveys a message to employees. To do this color must register a subconscious response on the part of the workman. Regardless of the purpose, "stop" or "go," it is not doing its job if it does not cause immediate action.

And secondly, it is easily seen that color generally has a powerful psychological effect which can be a great force in the overall safety of the plant. Alert employees, living in a bright and refreshing environment of pleasant color harmonies are not apt to become careless. Moreover, the pleasant surroundings will tend to make employees want to keep their work-place clean and neat, thereby eliminating the accidents which go hand in hand with dirty, sloppy surroundings. Workmen who enjoy their surroundings more readily keep their minds on their jobs and the task at hand. Well-lighted plants reduce the hazards of falling over or bumping against objects. All of these are important safety factors. All of these help to make production faster, worker morale better, accidents fewer and safety greater.

> Men in heavy industry will almost unanimously choose browns, blues and greens as the dominant color. However, in light manufacturing plants where women are employed, the trend is to the more delicate shades like turquoise and peach. Color must also be consistent with the general atmosphere of the plant. Cool colors are preferred where the interior of the factory is above normal temperature and where sunlight is excessive. Warm colors give better results in poorly lighted areas and departments which receive their light primarily from the north.



Zone marking bands on the floor in yellow or white are a warning to keep them clear. White under waste basket improves housekeeping. Yellow and black stripes on lift truck identifies hazard.

The Pay Off

Each month Occupational Hazards magazine plans to select one or more outstanding safety plan in some industry that has paid off in a dollars-and-cents return attributed directly to reduced compensation costs or indirectly to uninterrupted production of indispensable personnel.

Company ledgers too often have no provision in their columns for this investment of time and effort.

How industry cuts the high indirect cost of accidents: Finger-tip wall chart nails hazard spots

By ROSE D. MEYER

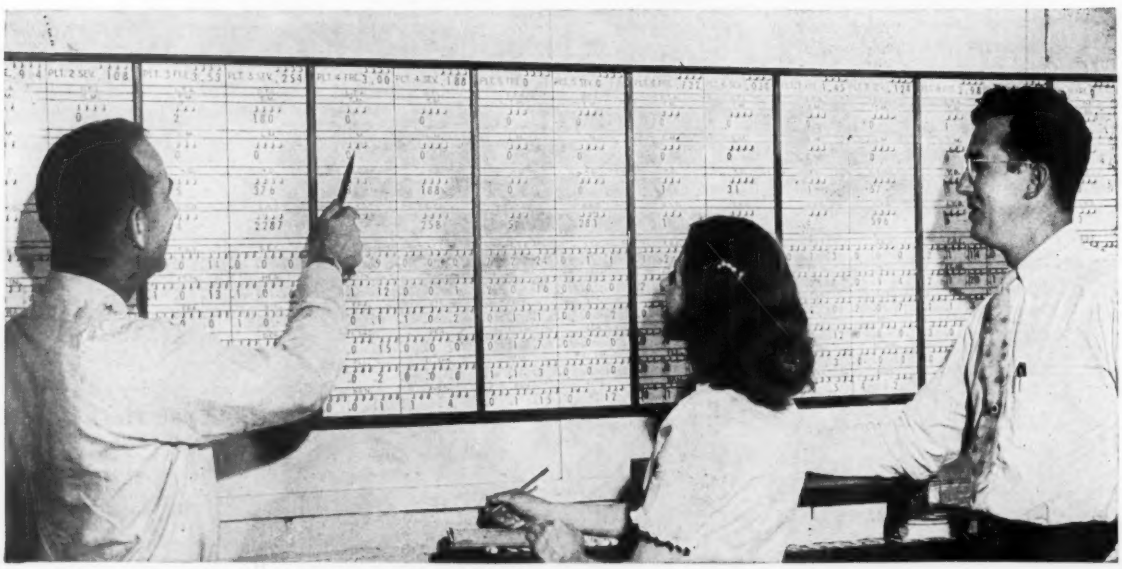
CONSPICUOUS in the office of Fred Yelton, Safety Director of the Delco-Remy Division, General Motors Corp., at Anderson, Indiana, is the Daily Accident Wall Chart. Quite simple and very practical, at first glance this multi-plant survey appears to be merely a jumble of figures and abbreviations. However, to all of the company's employees, men and women alike, it is an easily-understood self-portrait acting to improve their working condition and helping them to overcome many of their hazardous working habits.

Fundamentally, it is a daily graph of various types of mishaps, showing frequency and severity, and locating the accidents by individual plants. The permanent lettering is in leaf green. The figures that can be hung on to the hooks on the chart are red, so that the unit conforms with a standard color scheme. The main chart, recording accidents from all the plants, is located in the central safety office—that of Mr. Yelton—and individual plant charts are placed in each plant. With this daily over-all picture before him, the safety director can immediately spot an increase in frequency or severity of different types of accidents.

Safety Engineers Follow Records

The safety engineers responsible in each plant likewise have the same records available, which enables them to take corrective measures in their respective localities. They are thus able to study conditions on the spot and to make logical recommendations. Sometimes they discover that the machinery or the physical layout of a department is at fault; or that the only logical solution to stop certain types of accidents is for the employees to wear prescribed

Safety Director Fred Yelton (left) explains the main Delco-Remy wall chart, which records accidents from all the division's plants, to his secretary and one of the company's safety engineers.



safety equipment—such as steel-toed shoes, shatterproof glasses, helmets or other protective wearing apparel.

The board set-up has a top heading showing frequency and severity of accidents. Under "Frequency" is the abbreviation "L.T.A." (Lost Time Accidents); under "Severity," the abbreviation "D.T.L." (Day Time Lost). The following abbreviations come under these two heads: T.M. (This Month); L.M. (Last Month); Y.D. (Year to Date); L.Y.D. (Last Year to Date). The bottom section consists of a listing of some of the more common accidents and itemizes them as Last Month, This Month, and Year to Date. These accidents are:

F.B.E.—Foreign Body in Eye
FT. IN.—Foot Injury
FRA.—Fracture
FI. LAC.—Finger Laceration
FLL.—Fall
BRN.—Burn
S.E.C.—Severe Eye Case
HER.—Hernia
STR.—Strain
DER.—Dermatitis
EL. SHK.—Electric Shock

The bottom section is labeled "AVDS" (Avoids) and is subdivided into Hernia and Others. Here are recorded cases of employee sick leaves. When investigation shows that the absenteeism does not legitimately belong in the health or accident record, the safety chart is corrected.

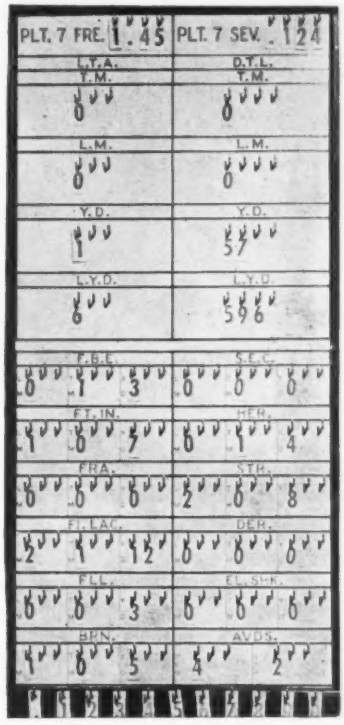
Director Modest

Director Yelton does not pretend that his ingenious chart will eliminate all accidents in the Delco-Remy Division plants. But he has convincing proof in his operation that it is contributing much toward improving the division's safety record which now shows notable progress over previous years.

In this connection he said: "At the present time our safety department, reduced considerably in size from our war peak, consists of the safety director, head of the department, four safety engineers on days, one safety engineer on nights, one investigator, and one secretary.

"Besides the safety engineers there are 1.) an educational program promoted through special safety bulletin boards in all plants, 2.) a NO, NO! picture program, and 3.) a five-minute personal safety talk to each employee once a month given by department supervision.

"As a result of the educational program in the past three years 5,000 of our employees have secured safety prescription glasses and 8,000 safety shoes. We do not stock this type of material, sell it, or distribute it from a company-owned commissary. All such items are purchased by the in-



One section of the accident wall chart, headed Plant 7 Frequency and Plant 7 Severity, showing how the abbreviations make for compactness.

dividual—with our help, of course, and at the best price available to us.

"Our plant has shown a year-to-year safety improvement. In 1945 there was a 28% increase over 1944. Last year we were in 24th place in the General Motors operations (over 125), with a rate that was 66% better than the corporation average. Our records indicate that for every employee hurt working at the plant, eleven of these employees are injured after they leave the plant.

Safety Education Important

"Our machines have the standard guards, but our department feels that guards are often overrated and not as important in many instances as safety education. By this I mean, you are much better off teaching an operator safety than to try to prevent him from getting into his machine, because regardless of how effective the guard is supposed to be, there always seems to be somebody clumsy enough to find some way of getting hurt. In educational programs, respect for machinery is taught, and intelligent operation is much more effective than a mechanical guard. We feel here that guards are the most essential on the obscure hazards."

To emphasize this point, Mr. Yelton explained with a concrete illustration: "A maintenance worker doing some repair work up on top of a large heating oven accidentally got his finger into a small V-belt motor drive beside which he was working. A belt guard on this drive which is up out of the way and probably visited once a month, is more important than a belt guard on a machine in daily use and about which the workers are safety minded. Our records indicate almost a negligible number of accidents on so-called 'dangerous machines.'"

Gives Proof

As proof of the unlooked-for danger he cited the cause of three recently reported accidents:

"A welder cutting metal with a torch let a drop of hot metal fall into his shoe. Of course, he got a foot burn.

"A worker walked across a wooden pallet approximately three inches high, but did not notice that there was a loose board lying on the edge of it. He stepped on the board. It flew up and hit him in the back of the head.

"Another employee washed his hands in lacquer thinner to remove some grease. A few moments later he sat down beside a small gas-fired soldering iron and the fumes from his hands ignited."

Expand Overseas

The formation of a new company to serve Sweden and Finland was announced recently by Bausch & Lomb Optical Company.

Jointly owned by the optical firm and Aga-Baltic Ab, well-known Swedish corporation, the new concern will be known as Aga-Bausch & Lomb Ab. With headquarters located in Stockholm, Sweden, it will serve as a distributor of Bausch & Lomb's entire line of scientific optical and ophthalmic instruments, equipment and eyewear.

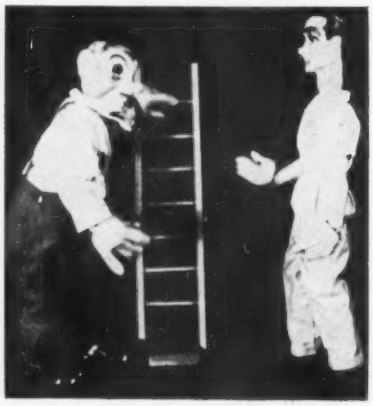
A feature of the newly-formed company is a Bausch & Lomb-equipped prescription shop which is already in operation. The function of the prescription shop is to perform final grinding and polishing of semi-finished lenses made by the optical firm, to turn them into finished prescription lenses ready for mounting in spectacle frames.

PULLING STRINGS FOR PLANT PROGRAMS

Puppet Shows are a surprising new promotion medium for industry and provide an "assist" in putting across the ever-present problem of safety training from a new slant — with a centuries-old technique.

IF you've exhausted all of the conventional means commonly used to get employees to accept safe practices or additional on-the-job training as an important part of their work, then you'll agree that in order to sustain a lively interest you'll have to come across with an occasional change-of-pace to jog up your program.

Two professional puppeteers, George Latshaw and Gerard Gentile of Cleveland, have gone back to a 2000 year old art (Did you know that puppets were found in the tombs of ancient Egyptians?) and came up with an ingenious turn to serve modern industrial training needs. This pair of clever string-pullers have devised specially designed marionette shows based on themes which are "naturals" when it comes to offering recreational type presentations in lieu of films, demonstrations, foremen talks and the like. Their presentations have met with widespread approval wherever witnessed in industry and the pair are rapidly expanding production facilities to cover all types of training with the novel medium.



Here is a sugar-coated form of instruction, made to order, which can prove an effective means of injecting that sadly needed "shot-in-the-arm" when employee interest sags. By using these units to offer a new and fresh approach for keeping the training problem vital, the safety committee can capitalize on the employee's penchant for something different and appealing as a substitute for the ordinary type meeting.

Latshaw and Gentile's method of working is easy and flexible. Their productions are mobile and adapted for presentation to any size gatherings, large or small. They furnish complete equipment and talent. Once inside the factory their show is set up and can quickly be transported from one department to another, reaching an audience of upwards of one hundred spectators depending upon available space.

In a typical scene, Mike, the old timer, offer a word of advice to "Lucky."

Mike to Lucky—"The foreman showed you how to do that job didn't he?"

Jones: "Yes."

Mike: "Then why didn't you do it that way. I know, I've been here for twenty years, seen them come and go. You follow the rules and you'll be okay."

The puppet manipulators rely heavily on the idea of reaching the worker's emotions and they easily and skilfully project and interpret color, comedy and action into each situation being portrayed, with a high degree of interest and audience appeal. Each individual skit is patently written to contain elements of human interest to the worker and typical plots, whether exploiting a specific or general problem, put across the fundamental thought that most accidents can be prevented if reasonable precautions are taken, and if the worker does his job in the proper way.

Irma, a provocative female worker, adds the necessary cheesecake which is so appealing to the shop boys.

FOR YOUR TECHNICAL FILE
Save Pages 19-20
For Future Reference
A Gold Mine of Information!

The WHAT and WHY of INDUSTRIAL SKIN DISEASES

A121. SKIN CANCER FROM OILS. Certain mineral oils used in industry, although usually not of North American origin, have caused multiple cancers of the prickle-cell type where the oil is in contact with the skin most frequently.

A122. SKIN HAZARDS AND THE PLANT CHEMIST. While the treatment and diagnosis of skin diseases are in the hands of a medical doctor or dermatologist (skin specialist), the employer or his safety engineer should have the responsibility for the hazard, the same as he would in any industrial accident program. Therefore, if your firm employs a chemist, the job of detecting and evaluating the chemical irritant involved can be his. For the small shops chemical laboratories are available for consultation.

A123. CHEMICAL SKIN IRRITANTS OTHER THAN OILS. Used widely in industry today are thousands of chemical skin irritants other than industrial oils. These include solvents, acids, alkalis, petroleum and coal tar products, dyes and dye intermediates, metallic salts, explosives, insecticides, soaps, resins, waxes, paints, colors, inks, drugs, essential oils, antiseptics, cleaning fluids, rubber accelerators and anti-oxidants, photo-developers, cements, slaked lime, plants, woods, clothing and clothing materials.

A124. SOLVENTS AND THEIR USE. Most commonly used in industry are solvents such as alcohol, kerosene, naphtha, benzine, benzol, turpentine, paint thinners, toluol, varsol, carbon tetrachloride, trichlorethylene and similar products. Industrial solvents are used in the following two principal ways: 1. For cleaning and degreasing (as a final operation or a preparation for a subsequent operation). 2. For changing the consistency of another substance as in paints, lacquers, varnishes, fabric dope, tanning, etc. Generally, the solvents do not react chemically with the materials on which they are being used.

A125. SOLVENTS AS SKIN HAZARDS. Any solvent that is capable of degreasing will dissolve the natural oils in the skin. The inevitable effect of continued exposure to this hazard is an eczema. Dried, cracked or fissured skin is subject to secondary infections from germs (staphylococci and streptococci) that invariably are present. Solvents also may cause allergic dermatitis.

A126. SKIN EFFECTS FROM OTHER CHEMICAL IRRITANTS. Dry chemical irritants present in the air inflame and burn skin, and cause severe infections where protection is not provided, as for example, in the manufacture of such explosives as TNT, DNT, dyamite, fulminate of mercury, tetryl, etc., when gloves, masks and protective clothing are not worn. Some alkalis (strong soap powder, lye, cements, etc.) tend to soften, dissolve and open skin layers to severe infection, not only in the use process but in the manufacture also. In some electrical equipment manufacturing processes the use of synthetic resins and waxes make "cable rash." Insecticides, such as DDT, can cause dermatitis. Other severe skin infections affect workers handling creosote in the shipbuilding and railroad construction industries, where creosoted timbers are used.

A127. VARIOUS HAZARD FORMS OF CHEMCAL AGENTS. In a number of the rust-preventing processes, such as electroplating, parkerizing, chromadizing, anodizing, etc., the tanks used contain strong alkaline or acid fluids which give off irritant vapors. Dermatitis is caused frequently by these mists and fumes coming from the tanks. Similarly, workers who clean the metals with strong acids and alkalis, or who even handle the wet metal, are so affected. Ulcers of the nasal septum (nostril partition) are common and frequently result in nose bleeding and actual holes in the membranes.

Again, as in the gas welding of stainless steel and aluminum alloys, there are fluxes used which contain fluorides. In addition to being possible irritants in themselves, these fluxes evolve hydrofluoric acid vapors, which, if not removed properly by ventilation, may irrtate nostrils and skin not protected with a proper protective ointment. Also, workers handling wet tetryl are less frequently affected than those exposed to the dust from dry materials. Workers usually are affected around the nose and eyelids and the skin may become blistered as from a second degree burn. From 10% to 15% of new workers are sensitized.

Very frequently fulminate of mercury causes dermatitis in the making of detonators, especially in hot weather. Inhaling the dust may cause dermatitis of the nostrils and eyelids. In making primers, the fulminate is used in wet form, but it dries on the clothes as well as on the skin and will cause severe dermatitis even on the covered parts by seeping through the clothing.

A128. COMBINATION OF ELEMENTS CAUSING SKIN TROUBLES. The interaction of causes of skin troubles has been called "synergic" and relates to the numerous external chemical, physical or mechanical agents involved in producing a skin hazard—factors which are difficult to duplicate when it comes to patch tests and other methods of control. Thus, added to a chemical exposure is the possibility of a wound on the skin from a mechanical agent, plus existing physical considerations, such as prolonged immersion in liquids, heat, cold, sunlight and perspiration, plus the possibility of infections from any bacteria present.

A129. AIR AS A SKIN HAZARD. When air is extra dry, it may so affect the skin as to cause fissuring or cracking, thus providing a point of entry for infection. Moist or humid air may inhibit evaporation of sweat and open dermatitis danger spots at friction points on the skin.

A130. SKIN EFFECTS FROM COLD AND HEAT EXPOSURES. Cold, particularly when accompanied by dampness, produces frostbite, as well as skin lesions in oversensitive individuals. Heat, wet or dry, can cause a thermal burn if of sufficient intensity, but even in a mild degree can affect the skin to cause dermatitis (with

The WHAT and WHY of INDUSTRIAL SKIN DISEASES

subsequent scaling) and can make the irritated skin vulnerable to chemical irritants.

A131. MECHANICAL AGENTS. Wounds in the skin from a blow, friction or pressure, lend themselves not only to bacterial infections, but it is thought they constitute a cancer hazard. Skin at the edges of any wound is fertile ground for infectious eczematoid dermatitis. In addition, traumatic skin troubles are sometimes complicated by an existing syphilitic condition and may lead to auxiliary sores.

A132. BACTERIA ENTRY. Pus formations indicate bacterial infection. Scratching, brushing or constantly rubbing the skin tends to break the protective layers and to permit bacteria from dirt, dust, hides, fur, raw silk, wastes, etc., to enter as infectious agents.

A133. OCCUPATIONS EXPOSED TO SKIN IRRITANTS. In the following table of occupations, workers exposed to specific skin irritants are listed:

Workers Exposed	*Skin Irritants*
Acetylene makers	Calcium carbide
Acid workers	Acids
Battery (dry) makers	Acids, zinc chloride, ammonium salts, charcoal
Carbide makers	Calcium carbide
Carbolic acid makers	Caustic alkali, phenol
Cement workers	Lime, pitch, resin
Chemical workers	Specific chemical explosives
Chromium platers	Chromium compounds, sulfuric acid
Degreasers	Solvents
Dye makers	Acids, benzine, caustic alkali, coal-tar products, dye intermediates, dyes, turpentine, antimony compounds, barium salts, calcium salts, cresol, dextrines, ferrocyanides, formaldehyde, gums, hydro-quinone, lead salts, phenol, potassium chloride
Electroplaters	Acids, benzine, caustic alkali, lime, potassium cyanide, soap, nickel sulfate, chromic acid
Enamelers	Alkalis, acids, arsenic, chromium
Explosive workers	Dye intermediates, explosives (TNT, etc.), ammonium salts, bromine, mercury compounds
Galvanizers	Ammonium chloride
Glass blowers	Charcoal, pitch, resin
Glass mixers	Caustic alkali
Insulation workers	Glass fibers
Lampblack makers	Soot
Lime burners	Lime
Machinists	Cutting compounds, lubricants, oils
Nickel platers	Zinc chloride, nickel sulfate
Nitroglycerin makers	Acids, explosives
Paint makers	Paints, thinners, allied products
Petroleum refiners	Caustic alkali, paraffin
Pyroxylin-plastics makers	Dyes
Rubber workers	Accelerators (hexamethylenetetramine), solvents
Tannery workers	Acids, lime, sodium sulfide, arsenic salts, brine, calcium hydrosulphide, chromium salts
X-ray and radium workers	Radiant energy
Zinc-chloride makers	Acids, zinc chloride

A134. BORDERLINE INDUSTRIAL DERMATOSES. Skin cases difficult to define as industrial are those in which occupational factors accentuate skin diseases; those in which complications of occupational and non-occupational dermatoses react on one another; those marked by a considerable time lapse between development of the dermatoses and the examination; those complicated by over-treatment.

A135. "HYPERSENSITIVITY." In general, the term, "hypersensitivity," means a greater individual capacity to react than is normally true. When applied to skin hazards, it refers to the reaction of an individual worker who is more sensitive to a particular substance than is the average worker.

A136. PREDISPOSITION FACTORS. Because of certain physiological or racial factors, various types of workers are reasonably sure to be affected by certain irritants. Among the factors involved are color and structure of the skin, structure and activity of the sweat and sebaceous glands, diet, age, sex, hygiene, body temperature, health, sensitivity, allergy.

A137. SKIN COLOR AND STRUCTURE AS FACTORS. Blond and red-headed workers, having light skins, regardless of race, are most easily affected by industrial skin irritants. Dark-skinned brunets are more resistant and dark-skinned Negroes are the most resistant.

A thick, oily skin withstands the action of alkalis and solvents better than a thin, dry skin, but, because it may have excessive hair, is more susceptible to infections of the hair follicles from such agents as petroleum oils, wax, coal tar, pitch, asphalt, etc.

A138. SKIN GLANDS AND SUSCEPTIBILITY. When sweat glands are overactive, perspiration causes softening and maceration of the skin layers when combined with friction. Perspiration also furnishes a solvent for soluble solid irritants on the skin, or reacts chemically with other substances that are present to form irritant compounds. However, in certain cases perspiration may act to dilute soluble irritants and remove insoluble irritants. When the sebaceous skin glands are overactive, they may increase the susceptibility to acne, because the excess material produced blocks pores and ducts of the skin.

(To be continued)

active, they may increase the susceptibility to acne, because the excess material produced blocks pores and ducts of the skin.
(To be continued)

Lime
Cutting compounds, lubricants, oils
Zinc chloride, nickel sulfate

Lime burners
Machinists
Nickel platers

AZARDS

• Hiding behind a barrel is in direct contrast to the safest technique we know . . . using CESCO safety equipment. • Come into the CESCO plant and you'll see the research staff putting CESCO safety devices through their paces—constantly running tests, checking design features and boosting maximum standards for CESCO products.

• Comfort features get detailed attention too, on the proved theory that the more comfortable the safety device the better use it will get. • Thus, CESCO combines quality and comfort in safety equipment which will be properly used. That adds up to a most effective safety program for you.

CHICAGO EYE SHIELD COMPANY

2308 Warren Boulevard • Chicago 12, Illinois

CESCO FOR SAFETY

from

MANAGEMENT'S POINT OF VIEW

Hazards are "Illegal" in Britain

By RONALD OGDEN

British journalist and writer who has made a special study of industrial conditions in Britain.

A nightmarish poster commissioned by the Royal Society for the Prevention of Accidents. Displays like this are even run in big British department store windows.

IS THIS OUR FUTURE?

WAR did not interfere with the drive to combat occupational hazards in Britain. In some ways it stimulated the drive. Numbers of unskilled workers, as in the United States, were swept into industry and their protection from accident was and still is not only imperative for their own sakes but for the sake of production.

For a time following the outbreak of the war Britain's industrial accidents increased, as they were bound to do, but as early as 1942 a decrease in fatal accidents of 17 per cent was shown on the previous year and a steady decrease has continued. Non-fatal accidents began to decrease in 1943 and were nine per cent less again the following year. A corresponding decrease has also taken place in industrial illness.

The success of the drive against accidents from power-driven machinery, for example, is shown by the reduction of the pecentage of such accidents of the total from 17.1 in 1942 to 15.6 in 1944, a notable achievement in view of the influx of unskilled workers during this period. One of the reasons for this was the increase of self-contained motive power with its elimination of dangerous overhead shafts and driving belts. Another was the improvement of guards.

Of particular interest in the latter connection is the report in 1945 of the Committee on Safety in the Use of Power Presses. These presses had long been recognized as one of the most dangerous machines in industry due to the severe mutilation resulting from trapping between the tool and the die. The committee consisted of 30 representatives of Britain's leading engineering firms. After careful deliberation it approved specifications of safe construction and standard performance of guards the adoption of which would prevent accidents of the type mentioned. In the particular case of the bending brake, which is a special type of power press, the final approved design was suggested by a foreman from a large engineering company.

One of the main difficulties which faced the Committee was the variety of different types of power presess in use and the different problems of protection presented by each type. They decided therefore to draw up a specification for the safe construction of power presses to which safety guards with a definite standard of performance could be applied in future. Thus the worker who goes from one factory to another will not have to learn a new set of safety rules or familiarize himself with a

Overalls and head covers are standard equipment for British women workers.

(Photos by British Information Services)

Factory workers in Britain are protected by law against their own mistakes and disobedience. Education against accidents, while also directed to factory workers for their own good, is even more directed to managers and executives. They are deemed responsible for the safety of those under their control, as a good officer is responsible for the safety, comfort and conduct of his men in one of the services.

new type of mechanism. In order to insure uniformity of design for the future, the Committee has asked that legal sanction shall be given to their specification under powers conferred by the Factory Act of 1937, whereby a factory can be forced to conform to definite safety standards.

Foot Injuries Common

Another common form of accident is injury to feet through heavy weights being dropped on them, or crushing by trolley wheels. It is estimated that one in seven of all industrial accidents come into this category. A simple and effective remedy for this is the provision of special footwear with a strong toe-cap to withstand the pressure of heavy objects. Though the supply of such footwear has been impeded by the war, it is now once more increasing.

An important factor in reducing industrial accidents is the work of the Royal Society for the Prevention of Accidents which by publicity propaganda and the training of safety officers for factories, has done valuable service.

In Britain great stress is laid on the responsibility of the employer to safeguard his employee by providing adequate safety precautions. In fact British law makes it an obligation on the part of factory owners to make their machinery foolproof and even goes so far as to enjoin that unless machinery can be made foolproof the employer should not use it. The plea that workers did not comply with safety regulations or obey orders, or even that they wilfully misused material or implements is not an adequate excuse for the evasion of responsibility for an industrial accident by an employer.

In the ship-building industry good progress was reported by the Chief Inspector of Factories in 1944. A large ship repairing firm was cited for holding periodic meetings on accident prevention while most of the larger firms had safety officers.

"In Scotland," states the Chief Inspector, "well organized meetings of safety officers have been held since 1941. Accurate statistics have been kept and useful work has been done in identifying causes. An interesting example of the value of this work is quoted by the local inspector. A certain shipyard showed a very high accident rate, having regard to the type of work it was doing. An analysis of causes of accidents suggested that this was due (1) to falls on the flat at a result of excessive untidiness of the yard (a matter confirmed by inspection) and (2) inadequate supervision of beginners. These points, backed by figures, were discussed with the management and Safety Officers and the firm is making a genuine effort to improve the position. The use of statistics pointed the way to remedying the conditions. In two other yards, the frequency rates were reduced by 35 per cent and by 40 per cent respectively in two years after the appointment of two good Safety Officers."

Industrial Illness Tackled

Turning to industrial illness, interesting measures were taken early in the war to combat health hazards, due to handling radio-active paint used extensively in war products such as luminous dials and indicators. As the result of stringent regulations due to intensive research into the clinical causes of the disease the incidence of illness has been greatly reduced. In this work the services of the National Physical Laboratory have been invaluable in carrying out tests and suggesting remedies.

(*Turn to Page* 35)

Workers handling sheet metal must wear leather gloves provided to protect their hands. The cutting machine is also equipped with a lattice protective guard, part of Britain's production-welfare tie-up originated during the war.

GO THOU AND DO LIKEWISE . . .

The Army Way

GI's had a habit during their period of service in Uncle Sam's Army of shrugging off the vagaries of indoctrination with the simple statement: "There are three ways of doing a thing —the right way, the wrong way and the Army way."

TOO often, the Army way of doing things has been found different—but it gets results, and not just on the battlefield. In the Army operation of more than 500 industrial plants employing well over a million workers at the peak of operations during World War II, the over-all safety and health record far outshone that chalked up during World War I by private industry, particularly in plants manufacturing ordnance supplies such as explosives, chemical warfare materials and similar dangerous products involving many toxic processes.

For the Small Plant, Too

Although the Army industrial health and safety program can be studied with benefit by practically any industrial plant, it is the small industry group, made up of plants which still collectively employ a majority of American factory workers, that has most to learn from the Army's industrial experience.

Proper supervision of health and safety of employees in small plants particularly where several small factories are fairly close to each other, was found by Army experience to be as practical as in larger plants—and worked just as successfully toward reducing compensation costs.

The message that the Army has for small business is this: When you can't justify the employment of a full time physician, nurse and safety engineer for yourself alone, get together with other small plants in the same city, county or other geographic district and arrange to receive such "big-time" services jointly.

Medical Safety Tie-up

"Close coordination between the medical and safety departments protected the health and safety of workers, increased production and efficiency, and reduced absenteeism as well as compensable injuries and illnesses," says the Army General Staff.

Believing this same profitable cooperation can be continued by private industry in peace time toward the same ends even in the small plants, the Army Surgeon General's office suggests small industries located in the same general area should hire physicians and safety engineers cooperatively and together make use of all local facilities such as hospitals, clinics, laboratories and health bureaus.

As an example of how this medical-safety cooperation can work to smooth out kinks in production and save employee turnover, Army men tell the story of an employee in one Army-operated plant who was hired despite a hearing defect and the skin disease called acne. The man was put to work in a soluble oil exposure directly under a large overhead crane using auditory warning signals. What may have been a tragic blunder was caught by the medical department and the man was transferred away from both hazards.

Another such medical rescue was made on a man with a history of coronary heart disease who was found to be operating an overhead crane at considerable peril to himself and fellow workers since the crane was not equipped with a "dead man stop." Needless to say the man was put on a sedentary job entirely removed from machinery.

Actually, there is no limit to the adjustments possible under an efficient medical-safety hook-up. In anticipating accidents, much of the ground work deals with the particular physical and mental equipment each worker brings to the individual job.

Misfits on jobs were screened out in tactful interviews with the medical-safety team, and transfers were initiated that saved entire departments from unjust accident records. Even employees temporarily set back by illnesses were not entirely lost to production but were given part-time or light work within their capacities.

Protective gloves, sleeves and creams were provided sensitive workers in possible dermatitis exposures, while in many cases investigations by the medical department caused important changes in irritant materials and formulas. Sand blasters, foundry and forge workers, and similarly exposed workers were given periodic examinations and chest x-rays to which they responded with alacrity.

The entire slant of the medical-safety hook-up in the Army-operated industries was aimed at keeping the most workers on the job the most days in the most healthy condition. In carrying out this "most" program, Army officials highlighted preventive medicine and emergency treatment, allowed workers to wash as often as they liked and provided tip-top equipment in lavatories, gave plentiful instruction in personal hygiene, and yet never took their sights off

orthodox safety precautions in preventing plant accidents.

The accompanying illustrations give a pictorial representation of how this was done. In essence, here is a ready-made blueprint for all private management to use free of charge in cutting down compensation.

Plants Surveyed

The Army Industrial Hygiene Laboratory surveyed plants for atmospheric conditions, toxic gases, fumes, dusts, ventilation and illumination. Pre-employment physical examinations included chest x-rays, and often serological tests for syphilis. Mobile first aid units were established. Mass tuberculosis surveys were conducted. Other phases of the program included:

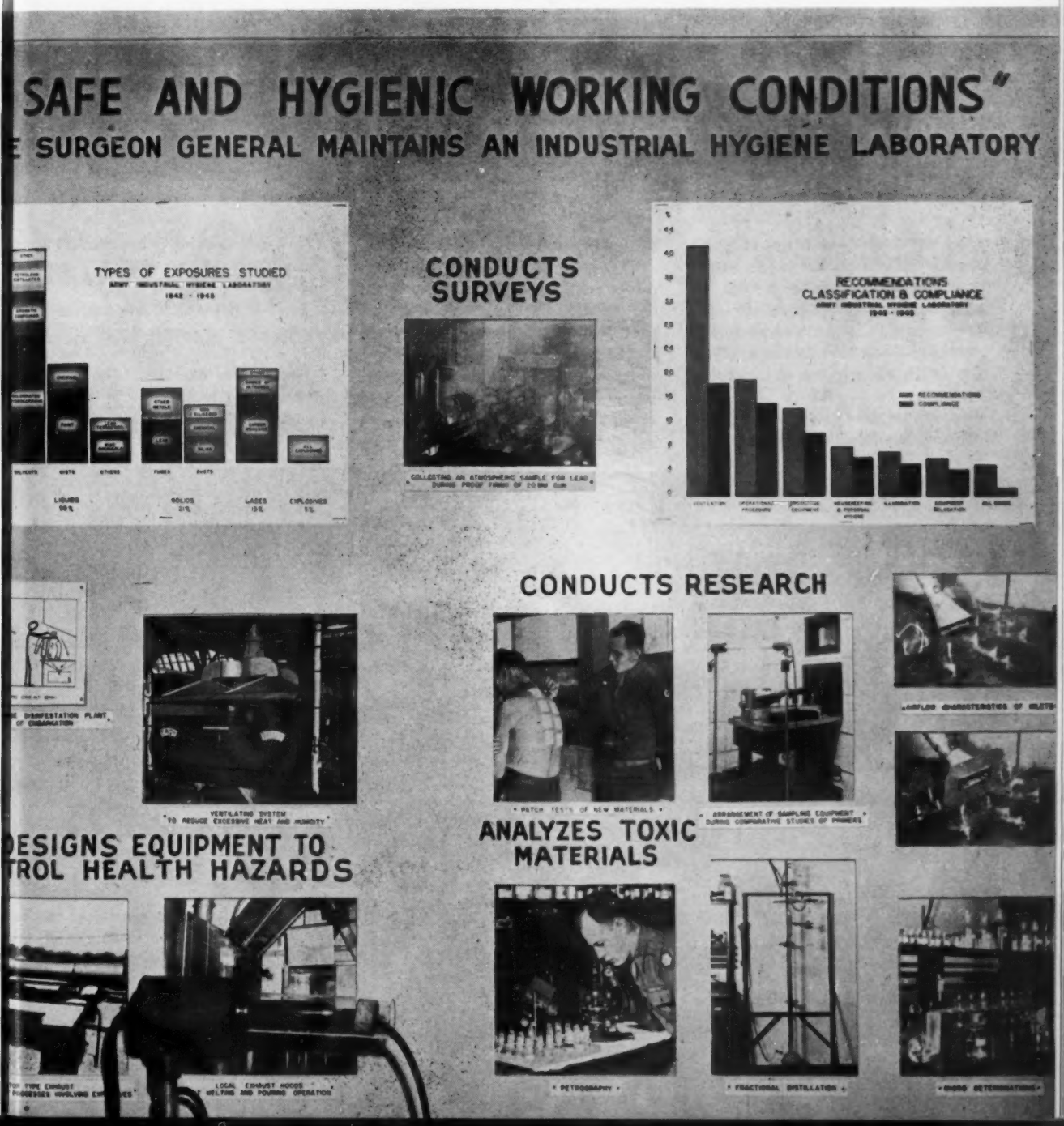
1. Treatment and after-cure of occupational injuries and diseases.

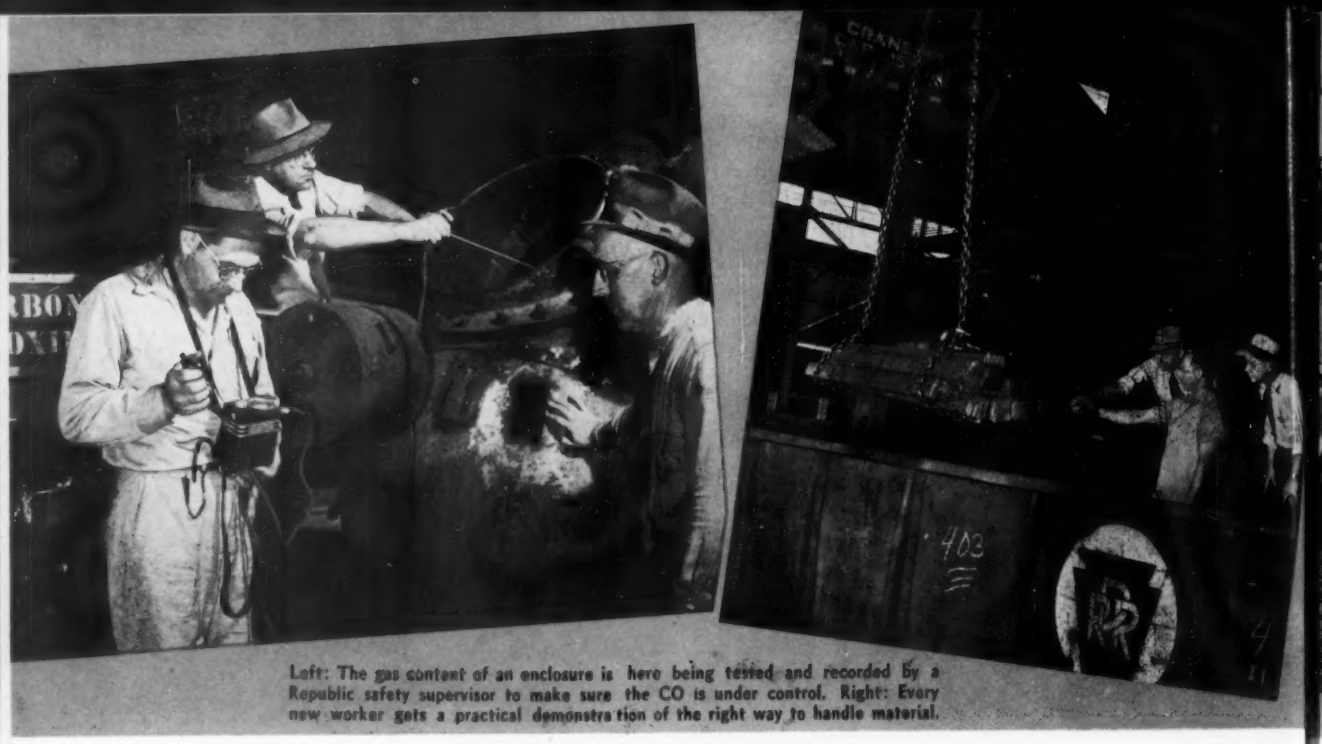
The pictorial chart below shows the manner in which the U. S. Army integrated its various health and safety services in the more than 500 plants it operated during World War II.

2. Emergency treatment for non-occupational injuries and diseases, so that employees could be kept at work.

3. Supervision of the physical condition of employees, so that no worker was put to work for which he was unfit, and so that detection of diseases arising out of working conditions was more certain.

4. Supervision of working conditions to control health hazards and toxic exposures.


SAFE AND HYGIENIC WORKING CONDITIONS"
E SURGEON GENERAL MAINTAINS AN INDUSTRIAL HYGIENE LABORATORY
TYPES OF EXPOSURES STUDIED
CONDUCTS SURVEYS
RECOMMENDATIONS CLASSIFICATION & COMPLIANCE
CONDUCTS RESEARCH
ANALYZES TOXIC MATERIALS
DESIGNS EQUIPMENT TO TROL HEALTH HAZARDS



Left: The gas content of an enclosure is here being tested and recorded by a Republic safety supervisor to make sure the CO is under control. Right: Every new worker gets a practical demonstration of the right way to handle material.

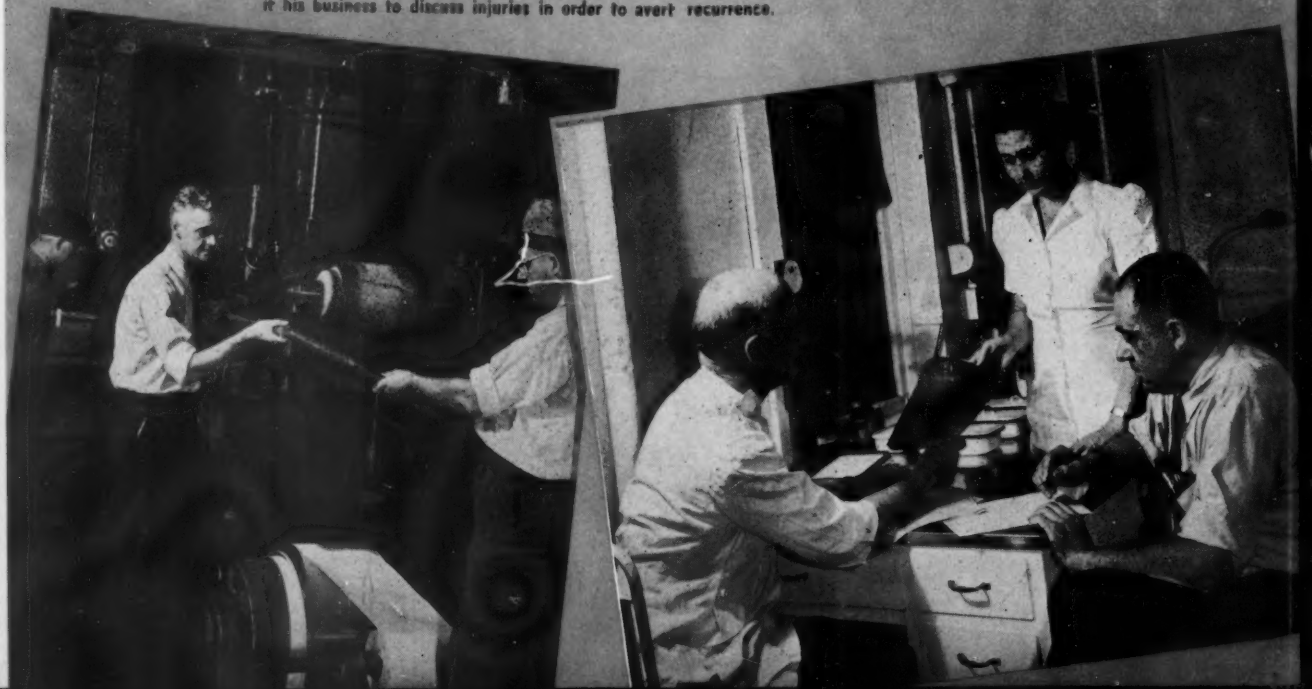
tricts there is an industrial relations superintendent and the safety supervision of the district is among his primary responsibilities. In the larger mills and manufacturing plants the industrial relations superintendent may have an assistant whose particular task is the operation of the safety program, but in others it is undertaken by the superintendent himself.

Through this network safety orders and recommendations from the central office in Cleveland are passed down and the reports on all accidents or other circumstances in which unsafe situations have been found are forwarded to the manager of safety. The office of the manager of safety acts in a distributory capacity to see that all districts benefit from experiences reported to him by any one.

Five of Republic's industrial relations superintendents representing five districts at which outstanding safety records have been attained responded to a recent request that they jot down, briefly, reasons why they

(*Turn to Page* 32)

Left: The coiling end of the stainless steel strip mill has a special guard rail, typical of many installed throughout all plants at the suggestion of the safety supervisors. Right: Prompt, skillful medical treatment cuts down accident severity in the well-equipped Republic dispensaries. The safety man makes it his business to discuss injuries in order to avert recurrence.



Left: All fire-fighting equipment at Republic plants gets a regular periodic inspection to make sure it is in top working condition. Right: Accidents are reviewed and preventive steps outlined at meetings of supervisors, a factor they deem highly important in maintaining a good record. The Cleveland Steel & Tubes Plant just won top district honors among all manufacturing plants with 1,281,931 man-hours without an accident!

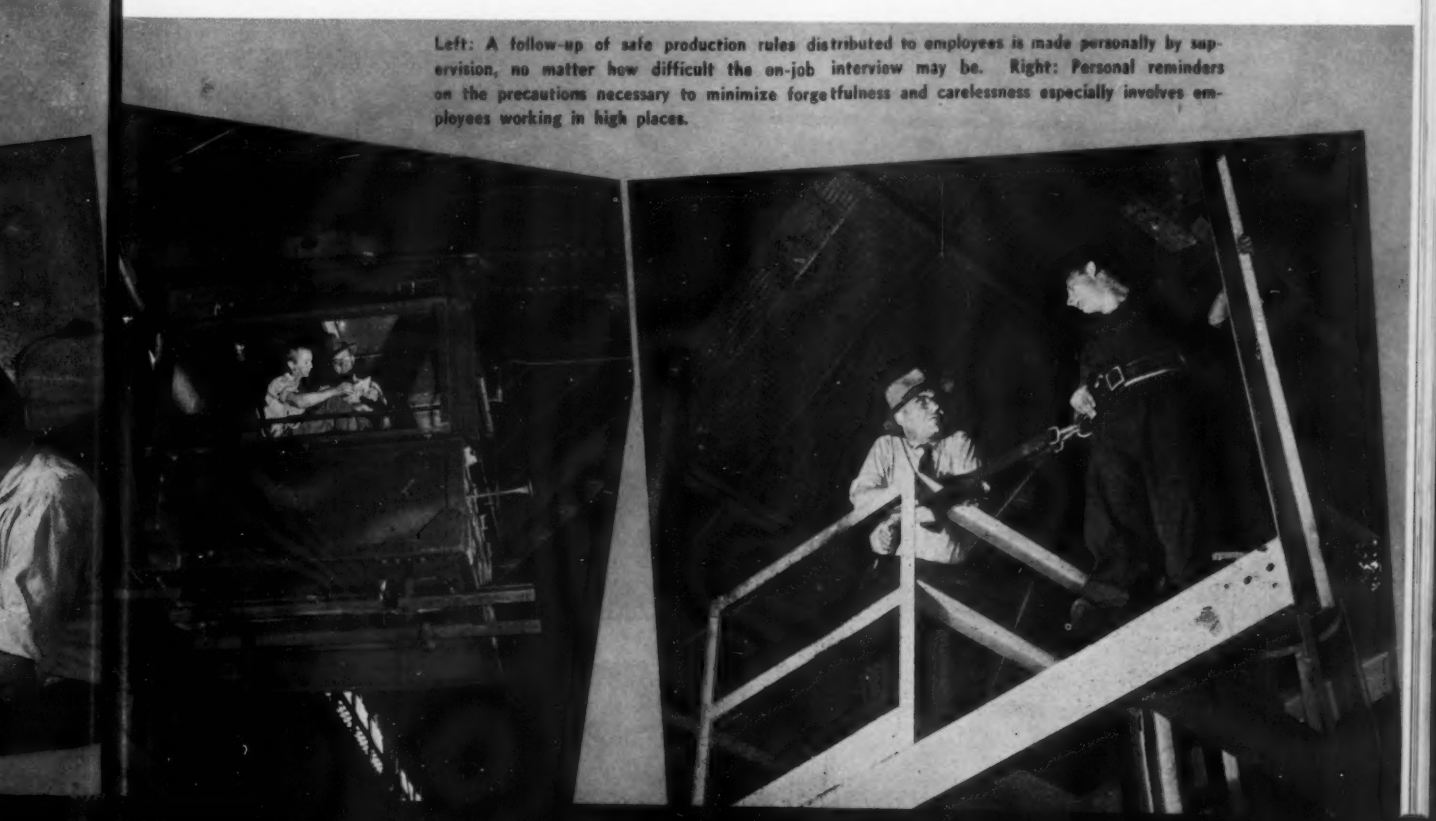
How Republic Did It

This month's plant picture story is particularly timely — it shows how and why a district safety contest was won for 1946.

THE Republic Steel Corporation has three distinct groups of activity: steel mills, manufacturing divisions and mines, both ore and coal. The safety program is operated directly under the general supervision of the vice-president in charge of operations, who has manifested an exceptional interest in a safe operating program. Execution of the program is allocated to a member of the operating staff, the director of industrial relations, who delegates the actual safety engineering and planning to the manager of safety, a member of his department.

Republic's mines, mills and manufacturing divisions are scattered through the East, Middle West and South. At each of Republic's dis-

Left: A follow-up of safe production rules distributed to employees is made personally by supervision, no matter how difficult the on-job interview may be. Right: Personal reminders on the precautions necessary to minimize forgetfulness and carelessness especially involves employees working in high places.



MEN AND MATTERS

News • Activities • Plans

New Turco Sales Chiefs . . . Appointment of L. H. Moulton to the post of National Sales Director and D. T. Buist, Assistant National Sales Director, was announced recently by Ray Saunders, Vice President and General Manager, Turco Products, Inc. Their headquarters will be the firm's main office in Los Angeles.

Solvent Warning Labels . . . A current Safety Research Institute release warns that containers of organic solvents should always be carefully labeled to avoid solvent accidents. Since these chemicals are generally colorless and often have a pleasant odor, they may therefore be mistaken for harmless liquids. In this way, unlabeled containers of solvents may lead to accidents as a result of ingestion or inhalation of the vapor. Moreover, the fire hazard of flammable solvents is not apparent unless stated on the label.

Lift Truck Eliminates Hazards . . . The adoption of mechanized material handling in the cotton storage warehouse of National Electric Products Corporation, Pittsburgh, is largely responsible for elimination of such safety hazards as fatigue, back-strain and hernia.

Educational Charts . . . To help prevent accidents in industrial plants, and to stimulate interest in safety practices among plant employees, Stanley Tools, New Britain, Conn., has prepared a series of thirty-six safety charts. Each chart gives one complete message. U.S. price is $2.50.

Illustrations for the Stanley safety charts are humorous drawings.

Keep This Tested and Proven War-Time Veteran on the Job

In many plants TARBONIS (Liquor Carbonis Detergens in a vanishing type cream, odorless, greaseless, stainless) during the war period has proved a real aid against the occurrence of industrial dermatitis. Your plant physician knows also how effective it has proved in clearing up many stubborn skin conditions encountered in industry. Discuss TARBONIS with him, and use the coupon for a generous sample and literature.

THE TARBONIS COMPANY
4300 Euclid Ave. • Dept. OH • Cleveland 3, Ohio

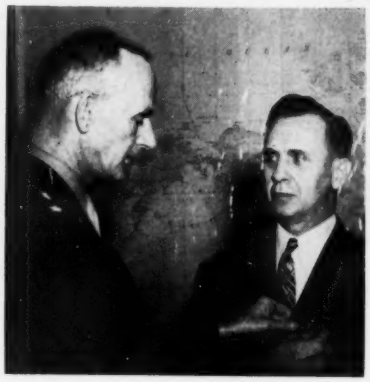
Please send TARBONIS sample and literature to:

Company .....

Address .....

By ..... *Department* .....

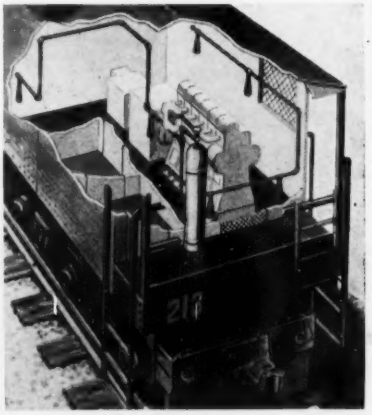
Decoration . . . Oresto F. Wells, Air Transport Command chief safety engineer, is shown (above, right), as he was presented the meritorious civilian service emblem, by Major General Robert M. Webster, (left),



ATC commander, in Washington recently.

Mr. Wells, who is from Centerville, Iowa, has been instrumental in establishing an effective accident prevention program in the Air Transport Command, and many of his suggestions have been adopted for overall Army Air Force use.

Safeguarding Diesel Locomotives . . . A completely built-in fire protection system, designed by Walter Kidde & Company, Inc., Belleville, N. J., has been installed on the 110-ton diesel-electric ore car used for blast furnace and steel plant service by the Carnegie-Illinois Steel Company.



The fire protection system uses carbon dioxide as the extinguishing agent and is recommended by fire protection engineers for flammable liquid and electrical fires. Because diesel engines have a combination of oil and electrical equipment, carbon dioxide is well suited for the job.

EYE HAZARD SIGNS

NOTICE
ALL PERSONS WORKING IN THIS DEPARTMENT — MUST — WEAR GOGGLES
SAVE YOUR EYES WEAR GOGGLES
SAFETY FIRST
WEAR GOGGLES OR USE SHIELD
DANGER
WEAR GOGGLES WHEN CHIPPING OR GRINDING
CAUTION
WEAR GOGGLES WHEN USING THIS MACHINE

You'd think men would be most careful to safeguard a priceless possession . . . their sight.

Yet they take chances with their eyes . . . neglect to wear goggles on hazardous jobs or risk loss of sight in other ways.

STONEHOUSE SIGNS

FOR ACCIDENT PREVENTION

Drive Home the Warning . . .

"SAVE YOUR EYES"

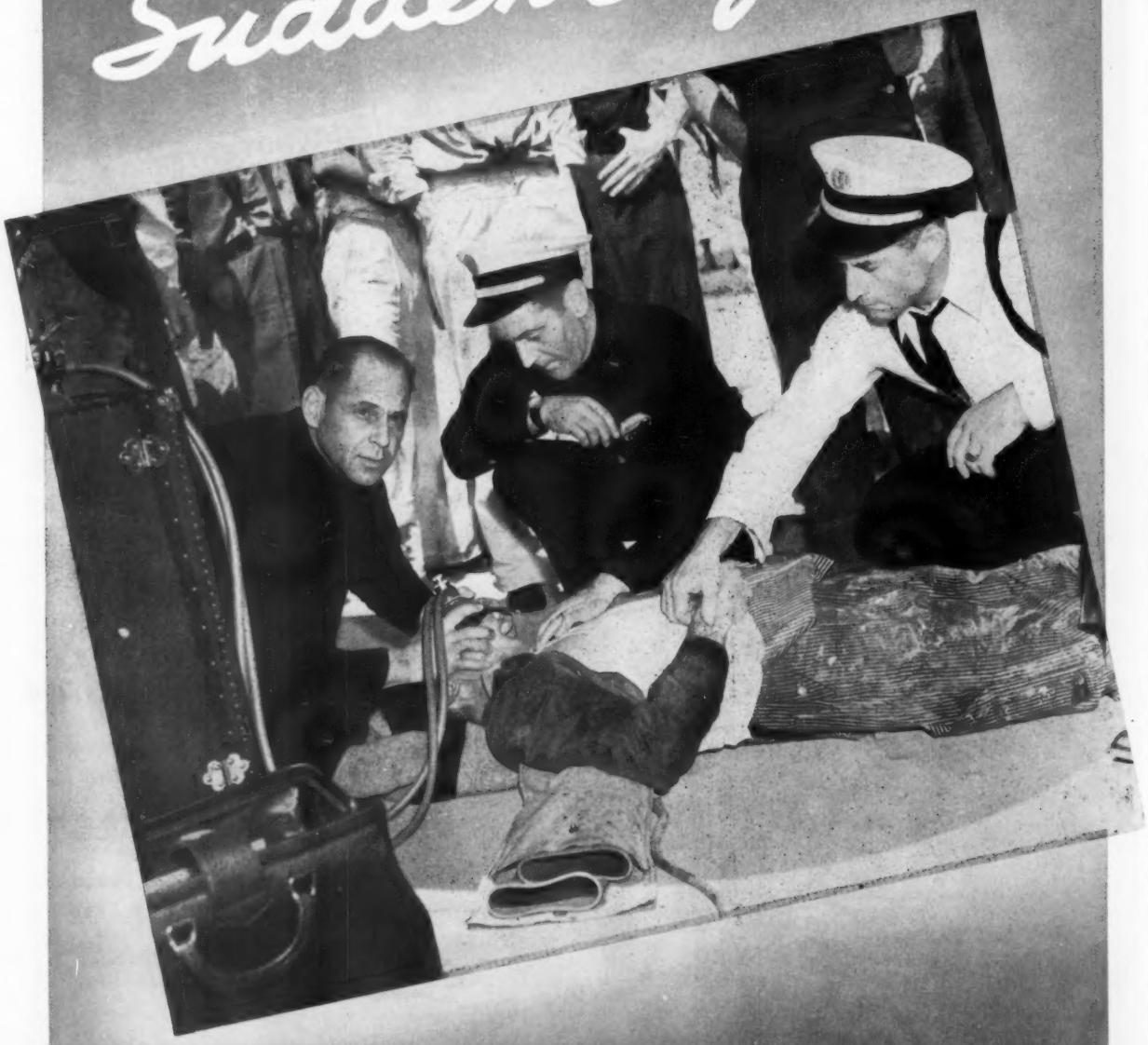
In Stonehouse Catalog No. 8 there are many Eye Hazard signs. It's Free on request.

Stonehouse SIGNS, INC.
MANUFACTURERS

"SIGNS SINCE 1863" 842 LARIMER ST. DENVER 4, COLO.

ACCIDENT PREVENTION SIGNS IN STANDARD COLORS AND DESIGNS

. . . And Sudden Injury



You're looking at an object lesson in the old, old story of overconfidence. It's not a pretty picture. It's the picture of a pair of overalls on what used to be a crackerjack electrician. He was on a maintenance job—a routine assignment which he had done over and over. But he forgot to be cautious near some 48,000-volt wires. →

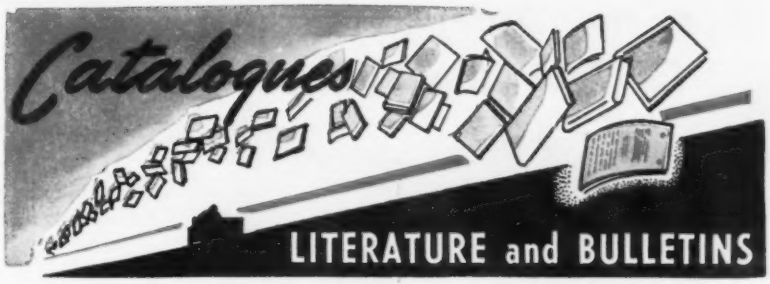
← And Sudden Injury . . .

JUST touched one wire with his elbow, his buddy said. He turned into it without looking first.

You do it every day on your own job. You move with a fast, accustomed rhythm, with motions preceding thought. You don't have to look first. You just KNOW you're in the swing. Overconfidence? Not you. You just have your job pat—so you can think about something else. Fortunately, you're not always playing with lightning. But the picture shows what happens to a man when he even gets too used to playing with lightning.

The inhalator squad worked two hours trying to return life to those overalls. You can bet the object lesson was not lost on the group standing around, anxiously waiting for that flicker of a pulse that never returned. Electricity does marvelous things for civilization—under control. In the body it's unpredictable.

Even following resuscitation, there may be residual, permanent damage to the brain, the spine or other parts of the nervous system due to lesions similar to those of concussion. Take another look at the picture. Can a man afford to be overconfident, with Eternity sitting at his elbow?



The publications featured on these pages were written by experts. They may be obtained without charge. To obtain these use the postcard bound into this issue.

FL 550—Fire Prevention Data . . . Twenty page booklet titled "It Can Happen Here," issued by the Gamewell Company, giving facts and figures on protection of life and property against the ever-present menace of fire.

FL 551—Industrial Color Conditioning . . . A new 32-page booklet illustrated in full color, is made available by E. I. duPont de Nemours and Company. Illustrates and describes treatment of equipment with color to increase production, improvement of seeing conditions and creation of better working environment, and makes clear the fundamental principles on which color conditioning is based for good morale.

FL 552—Oil Maintenance . . . Literature of interest furnished by the Buckeye Laboratories Corporation on how oil used for industrial applications can be safely cleaned, dehydrated, degasified and stabilized through use of the Buckeye process.

FL 553—Insulation Tester Manuals . . . Two pieces of literature offered by the James G. Biddle Company, containing information on the how and why of safe testing of insulation resistance No. 1420, "Pocket Manual of 'Megger' Practice," and No. 1640 "How to Test and Avoid Trouble in Electrical Equipment."

FL 554—Fire Control Identification Signs . . . A pamphlet describing 3-way fire control signs which provide instruction, inspection and maintenance information for each and every type of fire extinguishers. Available from the Minute Company.

FL 555—Dust Collector . . . The Aerotec Company, through its sales engineers, Thermix Engineering Company, has recently announced a new bulletin No. 130 on an Integral to the grinding and buffing industry. Dust Collector specifically applicable

FL 556—Canteen Service . . . Bulletin material describing a modern aid to factory workers' efficiency and morale in the form of automatic candy dispensers. Issued by Automatic Canteen Company of America.

FL 557—Protective Work Handlers . . . New information on hand safeguards used in manufacturing and assembly operations describing the Old Hickory line of Steel-Grip protective work handlers, products of Industrial Gloves Company.

FL 558—Safety Chain Sling . . . Literature covering Adjust-A-Leg Chain Slings, a safe lifting assembly consisting of an equalizing unit and a continuous steel alloy chain for use in heavy industry. Manufactured by the Caldwell Company.

FL 559—Lime Scale Solvent . . . Bruner Corporation offers a bulletin describing San-A-Sol, a new cold process scale solvent for practical industrial purposes such as urinal, shower and toilet-bowl cleaning, as well as for water pumps, valve and steam equipment.

"WHALE HIDE" GLOVES

for all acids and solvents

These new synthetic rubber gloves have qualities that adapt them for wide industrial use. Their marked superiority against acids, oils, solvents and abrasions will save many glove dollars.

Full assortment of weights and lengths—Featherweight to Extra-heavy; 10½" and 18½".

Scientifically styled in the curved finger design to conform with the natural shape of the hand. Eliminates binding and tightness found in ordinary gloves and gives comfortable finger freedom.

Write for New Bulletin H-17 Covering Whale-Hide Gloves, Aprons, Sleeves and Protective Clothing.

IPCO Safety Equipment for all Industries

INDUSTRIAL PRODUCTS COMPANY

2830 N. FOURTH STREET · PHILADELPHIA 33, PA.

More than Safety...

for Your Glove Money

STANZOILS

of neoprene with amazing non-slip finish

● Wet or oily objects are handled as easily and safely as dry ones with these positive-gripping Stanzoils. That means confident workers, doing more with less effort. Besides, made of DuPont neoprene, these gloves stand up in oils, acids, caustics, last 3 to 7 times longer than rubber, provide better protection, cut your injury claims. Send for Stanzoil catalog showing many styles, weights, sizes. Write today.

STANZOIL PIONEER

Synthetic Rubber Division

THE PIONEER RUBBER COMPANY

258 Tiffin Rd., Willard, Ohio, U.S.A.

Los Angeles

OVER 25 YEARS OF QUALITY GLOVE MAKING

Now... Safer Stamping at Lower Cost with...

"Nu-Grip"* STAMPS

LETTERS
FIGURES
SYMBOLS

- New Design gives positive finger grip.
- Grip holes at exact point for perfect balance.
- Give workmen "feel of security" when stamps are struck by severest hammer blows.
- Available in sizes from 1/32" to 1".
- Write for data and prices.

Stamps are made of "Safety" Mecco alloy steel, on heavy duty blanks for all stamping applications.

* Patent applied for.

M.E. CUNNINGHAM CO.

SAFETY STEEL STAMPS

91 E. CARSON STREET — PITTSBURGH, PA.

REPUBLIC DOES A JOB

(Continued from page 27)

achieved such safety records. Their responses are dissimilar in many respects but there are several single points they all touch upon.

Two of these responses were received from industrial relations superintendents at steel plants. Both of these plants have been awarded a "Distinguished Service to Safety" award on the basis of having exceeded 1,000,000 man hours without a lost time accident.

A. J. Blantz of Republic's Central Alloy District, has had charge of safety at three large plants, one in Massillon, Ohio, and two in Canton, Ohio. Together these plants employ over 8,948 wage earners and have a tonnage capacity of steel ingots of 1,375,000 tons per year.

Mr. Blantz listed the following as among the reasons his district accomplished an outstanding safety record:

1. We have good lighting.
2. We have safety posters.
3. We paint for safety (distinctive coloration).
4. We demand good housekeeping.
5. We have General Safety Orders.
6. We have departmental rules.
7. We have job analysis for safety.
8. We have weekly safety meetings.
9. We correct unsafe practices.
10. We investigate near-accidents.
11. We try to profit by the unfortunate experiences of others.
12. We have able supervision.

Edmonts for Economy

Tough, synthetic rubber coating on palm and thumb tightly bonded to fabric. Outwears plain or combination gloves on abrasive and cutting action jobs. Water, oils, acids and caustics will not penetrate the rubber coating. Resists rip and tear for longer wear.

Economical and comfortable hand protection — Palm-Coated style No. 91.

Edmont

Rubber-Coated **WORK GLOVES**

514 ORANGE ST. . . COSHOCTON, OHIO

The trend of litigation on workmen's health and accident compensation is reflected in these briefs on the latest and most representative cases coming to trial in the intervals between issues. Familiarity with this trend is important to every industrialist. Clip cases and file for future reference.

Eye Ulcer From Irritations

BROWN was employed as a teller in a bank operated by his employer. On May 11th, 1944, while performing his duties in this capacity—wraping currency and silver in the teller's cage—about 1:00 P.M. the claimant became aware of an itching in his right eye and thought he had got dust in his eye. He was in the teller's cage at the time, having returned to work at the end of his lunch period, at 12:45 P.M.

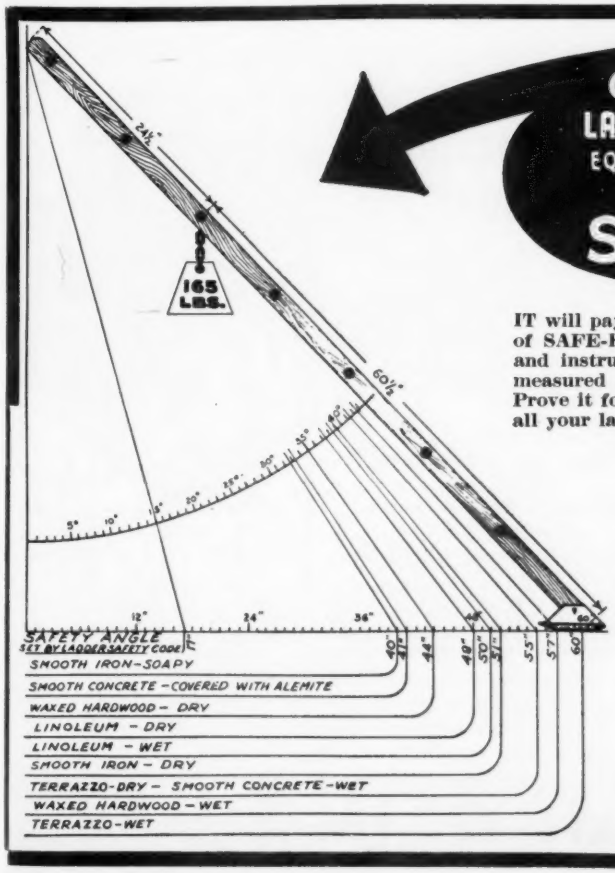
He mentioned his difficulty to the assistant cashier, who advised him to consult a doctor. The claimant then telephoned Dr. Clark, who prescribed an eye wash. The following day the claimant was still in pain and went to see Dr. Clark who referred him to another doctor who was an eye specialist.

He was thereafter treated by several eye specialists without success until Dr. Cosgrove resorted to the use of penicillin, which resulted in immediate improvement. It was found that the claimant was suffering from a corneal ulcer which could have been caused by dust or some other foreign body or by focal infection. No source of infection was found.

The bank contends that in the absence of proof that a foreign body may have lodged in claimant's eye during the course of his employment, that the finding of the Commission that Brown suffered an accidental injury was only conjectural. A further contention was that if injury was determined to be accidental there was no proof that it arose out of his employment.

The record indicated in the within case was substantial enough to sustain the Commission's ruling that an injury was received within the period of claimant's employment and at a time and place where he was required to be and while fulfilling his duties of employment. Applying the rules of liberal construction of the Workmen's Compensation Act, the evidence substantially established his employment as a contributory cause of his disability, and that a reasonable relation existed between his injury and the conditions and incidents of his employment. Recovery allowed.

Simmonds Nat'l Bank et al vs. Brown
Supreme Court of Arkansas 7/1/46.
195 W. Rep. end series page 539



CAN YOUR LADDER SHOES EQUAL THESE TESTS MADE WITH SAFE-HI

IT will pay you to find out. On request, we will lend you a pair of SAFE-HI Ladder Shoes for a month and will send drawings and instructions of a safe and simple method of making these measured tests in your own plant, under your own conditions. Prove it for yourself and you'll insist on SAFE-HI exclusively on all your ladders.

Rubber, cord and ridges in SAFE-HI treads hold on dry, wet or greasy floors. A self-sharpening spike holds on snow and ice.

Contact your safety dealer or write us for literature.

Safe-Hi PRODUCTS

ROSE MANUFACTURING CO.
1731 Arapahoe St., Denver 2, Colo.

Dermatitis From Blue Denim Cloth

ALMA SIMPSON started working as a machine operator for the Fair Maid Hat Manufacturing Company. She worked on khaki and blue and white striped material for approximately one year when she was given blue denim cloth to work upon.

She continued to work upon it until noon of the following day when she began to feel ill and left work. She went to a doctor who found an itching, burning, sore skin on the face and neck which he diagnosed as dermatitis.

A patch test was given her by placing a piece of the denim material on her shoulder and then it soon erupted as her face had. There was some evidence that the claimant had suffered from an alleged eczema prior to her complaint. However, there was nothing in the record indicating causal connection between this eczema and the type of dermatitis from which she suffered at the time.

In the absence of such claim recovery was allowed.

Simpson vs Gold
Supreme Court of Minn. 4-26-46
22 N.W. Rep. 2nd series, page 923

Suit Against Company Doctor

CHARLES HANCOCK, on February 25, 1941, sustained injuries arising out of and in the course of his employment by the Bunker Hill and Sullivan Mining and Concentrating Co. He was treated for these injuries at the Wardner Hospital operated by physicians, respondents Sta-

ley and McCafferty, who had previously entered into a contract to furnish medical, hospital and surgical aid and attendance to the company's employees under code provisions.

The within action is brought against the aforementioned doctor and assistant for alleged malpractice as a result of which Hancock's leg was amputated. The action was dismissed by a lower court by reason of the fact that Hancock accepted a stated sum in payment from his employer by reason of the accident which arose out of and in the course of his employment, which included permanent partial disability. The court claimed this does bar the recovery of damages for injuries sustained by reason of the negligence of a third party. Between this party and the injured employee the relationship of employer and employee is nil.

The higher court reversed this court and remanded the case for further proceedings against the physicians whose liability is based upon an act of negligence. The claim of the physicians was that full recovery under the Workmen's Compensation Act determines all controversy respecting rights of an injured employee who has received compensation against a third party tort-feasor. The Supreme Court therefore ruled that a tort action against the doctors for malpractice is not barred.

Hancock vs Halliday et al
Supreme Court of Idaho 7-3-46
176 Pac. Rep. 2nd series page 333

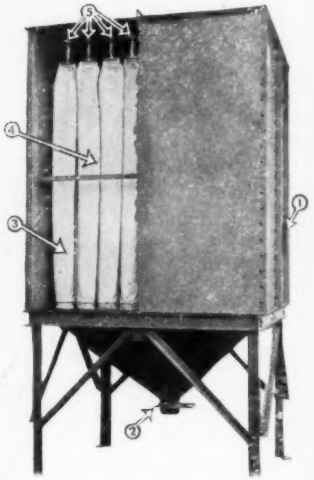
DIXIE
DUST COLLECTING SYSTEM

SAFEGUARDS EMPLOYEES!

Dust is an occupational hazard . . . causing fatigue, lowering resistance, breeding diseases. Result . . . increased absenteeism.

Hold that fine dust line! Dixie Tubular Dust Collectors reduce dust hazards . . . increase human comforts . . . promote safety . . . increase personal efficiency.

DIXIE "SNAP ACTION" GETS ACTION!



Dixie Tubular Dust Collectors are simple in design . . . sturdily built . . . positive in action . . . gives smooth, non-vibrating operation. Here's how Dixie Safegguards Employees automatically . . . completely . . .

1. Dust-laden air enters below bottom plate.
2. Dust settles in hopper.
3. Fine dust rises and collects inside of tubes.
4. Filtered air passes through porous walls.
5. Dust forced into hopper by Dixie "Snap Action."

Dixie Dusty Says

"Dixie not only safeguards your employees but protects the finish of your products from "dust-blemish." Write me today about your dust problems . . . you'll receive definite data . . . no obligation."

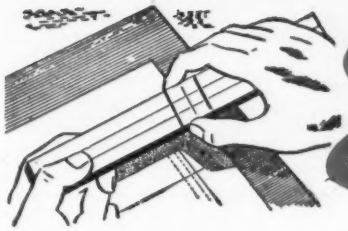
DIXIE MFG. CO., INC. 1325 Russell Street, Baltimore 30, Maryland

HAZARDS ARE "ILLEGAL"

(*Continued from page* 23)

To sum up then, while certain specific safety precautions are being evolved in engineering and heavy steel industries, accidents due to power machinery are only a small proportion of total industrial accidents—less than 1/6th in fact—and that proportion is diminishing. The most important side of accident prevention in Britain is not spectacular, it lies in the slow, painstaking work of Safety Committees and Officers.

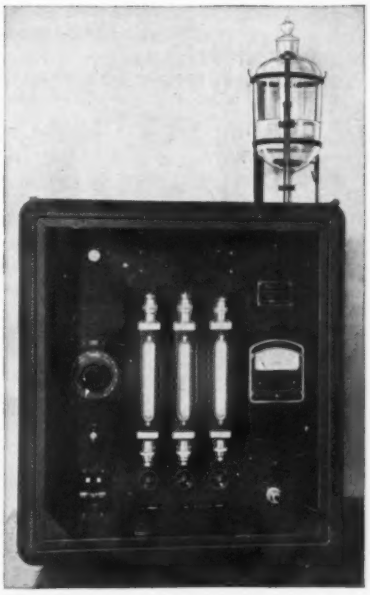
In the words of the Chief Factory Inspector's Report for 1943: "The primary function of a safety organization is not to 'fet at the worker,' and there should be sufficient representation from the floor of the shop to prevent even the suspicion that this can occur. The golden rule in preventing mechanical accidents has always been 'make the machine safe.' This is just as true in the case of non-mechanical accidents; the first attack must be on the process, the tool, the gangway—not on the worker. *In the vast majority of cases, the words 'the human factor' on the lips of the Safety Officer are an admission of failure."*



New Products

For further information on any of these products, simply list the key number at the foot of each item on the special post card enclosed with this issue.

EXPOSURE ANALYSER — The health and even the life of workers exposed to carbon tetrachloride, trichlorethylene, chloral and other halogenated hydrocarbons can now be safeguarded by means of the Westvaco Halogenated Hydrocarbon Analyser, offered by Industrial Instruments, Inc., Jersey City, N. J. Available in both portable and permanent-installation forms, this equipment is said to determine halogenated hydrogen concentrations and, when used in conjunction with the Conductivity Recorder, provides a continuous record of the magnitude of the contamination. **NP 79**



The Yardstick for Cleaner .... Better... FLOORS

• The durability of Hillyard Floor Treatments is measured by their Hi-Quality and the fact that for nearly a half Century they have given lasting satisfaction in the protection of all types of floor surfaces and in economy, time saved and labor costs reduced.

• There is a Hillyard Floor Treatment Specialist in your community ready to give advice on any floor treatment or maintenance problem . . . write or wire us today . . . no obligation.

THE HILLYARD COMPANY

DISTRIBUTORS..HILLYARD CHEMICAL CO....ST. JOSEPH 1, MO... BRANCHES IN PRINCIPAL CITIES

370 TURK ST., SAN FRANCISCO, CALIF. 1947 BROADWAY, NEW YORK, N. Y.

LOW FLOOR MACHINE — An extra-low disc-type floor machine of new design, for polishing, scrubbing, steel wooling and other maintenance, has been introduced by the G. H. Tennant Company, Minneapolis, manufacturers of floor equipment.

Unique feature of the new machine is a special side-polishing brush which cleans and polishes flush with the walls, even polishing the baseboard. The brush, which has bristles extending beyond the circumference of the disc and approximately two inches high, eliminates bumping and scratching furniture. It also permits fast operation under crowded conditions.

The machine has been kept to an overall height of less than 12 inches through the use of a "pancake-shaped" motor centrally mounted over the cleaning disc. This permits the machine to operate in formerly "inaccessible" places such as under desks and machinery. **NP 80**

PLEXIGLAS SHIELD — A tough, transparent Plexiglas device which simultaneously protects workers' eyes from flying metal particles and provides for the efficient recovery of gold particles or "sweeps" in the production of dental appliances has been introduced by the Dilley Manufacturing Company, Cleveland. Appropriately called the "Gold Digger," the Plexiglas guard is typical of many such guards now popular in industry because they permit the operator an unobstructed view of his work.

Easily cleaned with soap and water, according to the manufacturer, these transparent plastic shields are said to be shatter-resistant, lightweight (one-half that of glass), highly-resistant to chemicals, and made colorless in transparency. **NP 81**

NEW ABSORBENT — A new oil, grease, and water absorbent produced from a unique alumina silicate material and reported capable of absorbing from 120 to 140 per cent of its own weight has been announced by the Blue Mountain Clay Co., Inc., of Memphis, Tenn. It will appear on the market this fall. Used on oily, greasy, or wet floors, the absorbent is said to eliminate danger of accidents due to slipping, at the same time keeping floors clean and minimizing chances of flash fires. **NP 82**

CEMENT HARDENER—Concrete floor dusting is said to be stopped instantly and longer life for your floor is now obtained through the use of STONHARD STONTOP.

Applied to new or old concrete floors, STONHARD STONTOP penetrates and by chemical reaction with the cement, is reported to harden and fortify the surface against the effects of acids, grease, oil, and abrasion. The manufacturer's release states his product keeps floors smooth, safe, and sanitary. **NP 83**

SPIRAL-WIRE HOSE — A new process for the manufacture of lightweight spiral-wire reinforced hoses and accessories has been developed by the American Ventilating Hose Co., New York 7, New York. It has been designated as the "Continuous Wind" process to differentiate between it and other manufacturing methods. The hose manufactured by this new process supplements the "Flexaust" types now being used for ventilating purposes and in fume and dust control by a variety of industries. **NP 84**

ANYBODY FALL IN YOUR PLANT LATELY?

WHEN I BUY SHOES, I USE MY HEAD TO KEEP MY FEET ON THE GROUND

TRADE GRO CORD MARK

Safer SOLES & HEELS provide safest footing with a maximum of comfort because CORD-ON-END construction makes them NON-SLIP for the life of the shoe.

NON-SLIP CORD-ON-END

Falls on flat surfaces are your greatest hazard. Supply safety shoes with GRO-CORD soles and heels. The original CORD-ON-END construction gives firm traction, adds long wear.

GRO-CORD RUBBER CO.
LIMA, OHIO

Dionol
FIRST THOUGHT IN MINOR INJURIES

Iodized Dionol . . . and Plain Dionol injury dressings have been used continuously by top industrial organizations for up to 20 years.

No reported Iodine burns under bandaging . . . Safe, rapid and effective healing . . . After infections almost unknown if instructions are followed . . . Decreased disability time loss. . . Write for information and samples.

The Q.V. Corporation
(Formerly The Dionol Co.)
Remington Building
KALAMAZOO 11, MICH.
OH-1-47

VENTED GOGGLE — The American Industrial Safety Equipment Company, Brooklyn, N. Y., announces its new Eye Gard Champion Goggle. These goggles may be recognized by their mahogany color. They are made of a new light, strong, flexible plastic that is molded to fit the contours of the face.

One of the unusual features of the Eye Gard Champion goggles is that they are vented through side screened ports and side shields to allow air in and out. In addition, there are nine ports all around the lenses which provide ventilation where it is needed most and prevent lenses from fogging. **NP 85**

TALKING BULLETIN BOARD— A new electronic wire recorder that averts accidents by announcing safety

precautions and traffic warnings, and also serves as a talking bulletin board for industry, public events and transportation arrivals and departures, was unveiled recently.

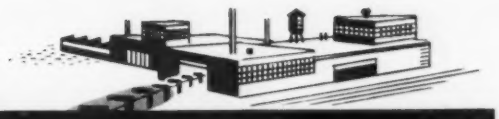
A product of Sound Media, New York, it cautions people before an injury or fatality can occur. Increased sound volume will be employed in the traffic applications to prevent, for example, railway crossing accidents due to not hearing the warning.

For talking boards in industry it calls attention to items of interest as employees or students walk by (instead of stop at) the bulletin boards. Thus, important announcements cannot be missed. **NP 86**

FREIGHT CAR-DOOR OPENER— A new 1947 model of the Monarch One Man Car Door Opener has been announced by The Mining Safety Device Company, Bowerston, Ohio.

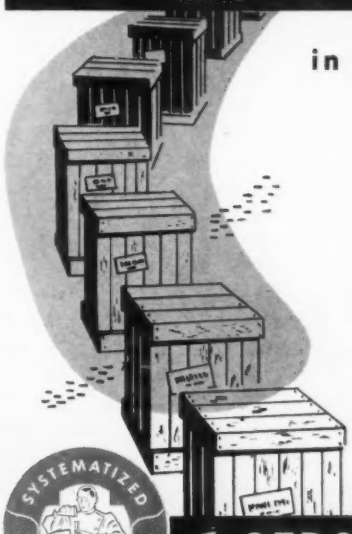
One man can open or close the most obstinate freight car door, and do it quickly and safely, with the opener, according to the manufacturer. Instead of taking several men off other work to tug and yank, risking mangled hands or other serious injury, one man with this simple device can do the job without hazard.

The steel case has been redesigned to enclose the locking pawl and to eliminate any interference with cor- to enclose the locking pawl. NP 87



Production Increases . . .

in an ORDERLY PLANT



Gerson-Stewart's simple plan of Systematized Sanitation helps lower your manufacturing costs and increases production by making your plant a safer, healthier, more orderly place in which to work. Maintenance costs too are reduced through more efficient use of your own plant-cleaning personnel. During the past 30 years, hundreds of leading concerns have made important savings with Systematized Sanitation. Write today for our latest illustrated booklet.

Systematized Sanitation enables your present labor to do more tasks—better!

SYSTEMATIZED SANITATION

The GERSON-STEWART Corp.

LISBON ROAD · CLEVELAND, OHIO

---

14 Formulas ISOLATE MORE THAN 2000 SKIN HAZARDS

Industrial Dermatitis Is Stopped by PLY Creams and Liquids

PLY the before-work Protective Cream

"Apply PLY" has been the watchword for 15 years in safeguarding industrial workers against dermatitis. PLY provides such positive protection that it is referred to as the "invisible glove."

Send for our new, fourteenth edition, "The Answer to Industrial Dermatitis," the most complete reference book of its kind. This book provides detailed information for segregating and isolating more than 2,000 skin irritants.

"The Answer to Industrial Dermatitis" will prove especially helpful to Safety Engineers, Plant Physicians and Nurses, Personnel Directors, and Works Managers.

PIONEERS IN RESEARCH FOR PREVENTION OF INDUSTRIAL DERMATITIS

THE MILBURN COMPANY

3246 E. WOODBRIDGE ST. · DETROIT 7, MICH.

WHEN *Quality* COUNTS MOST

► Time-tested by 35 years' use in industrial plants throughout the country, Steel-Grip Protective Work Handlers have always proven a spur to production because they have always facilitated work with safety. Not only have they also met the many special industrial needs growing out of war-born manufacturing techniques, but they are ready to meet any new needs of industry as the country returns to peace. Shrewd safety men, aware of the acute needs of accelerated peacetime production, are turning to the Industrial Gloves Company for the answer to *any* and *all* handling problems. Why not submit *your* problem *Now*?

NO. 616 — General purpose work glove, steel stitched chrome leather. Practically rip-proof. Also with four inch gauntlet. Price No. 616—$1.50 per pair.

NO. 14314—The standard Steel-Grip Finger Guard designed for use on small punch press work, buffing, burring, grinding, inspection, etc. Tough flexible leather with elastic webbing back. Eliminates minor but costly finger injuries. Price: 8c each. Special quantity discounts.

NO. 644 — Steel-reinforced, chrome leather gauntlet. Steel ribbons over extra tough strips of leather; steel stitched throughout. Price $2.20 per pair.

NO. 14730 — Heat Resistant Mitten. Made of special tanned leather—jumbo size for utmost in ventilation and coolness. Wool lined. Easy on and easy off. Price $2.25 per pair.

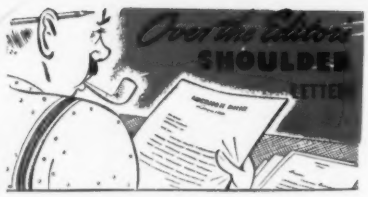
Industrial
GLOVES COMPANY

Main Factory
733 Garfield Blvd.
DANVILLE, ILLINOIS

STEEL GRIP

Branch Offices
in Detroit and Newark

(In Canada: SAFETY SUPPLY CO., Toronto)



Selling Eye Protection

OCCUPATIONAL HAZARDS:

I have been reading your magazine, OCCUPATIONAL HAZARDS, for a number of years. I find the magazine interesting and helpful in safety programs. It gives us the views of others in safety work and brings to our attention new equipment on the market.

The story on Selling Eye Protection and how the Wilson Company was co-operating was especially interesting to me. Our medical department at the West Coast Shipyards, in which I worked as supervisor, handled 125,000 eye cases in the last three years of the war, our top payroll was 5000 men. This was at Vancouver, British Columbia.

If possbile, I would appreciate receiving some of the posters, mirrors, etc., used by the Willson Products Co. in their campaign to sell eye protection. We have been using mostly Willson goggles and the workers seem to appreciate the fact that they are comfortable and yet do the job. —T. Foreman, Safety Engineer, B. C. Bridge & Dredge Co., Ltd., Port Alberni, British Columbia, Canada.

Your request has been submitted to Willson Products Company.—Ed.

On Solvents

OCCUPATIONAL HAZARDS:

We were rather impressed with the contents of your magazine and were pleased to note the increased size. We feel you should be commended on your article, "Do You Know Your Trade-Name Solvents?" (October OH).—George W. Cox, M.D., State Health Officer, Austin, Texas.

Fiber Glass

OCCUPATIONAL HAZARDS:

Please send me additional information on fiber glass protective creams as mentioned on page 18 of your October issue. — Leland C. Stearns, Safety Engineer, U. S. Air Station, Alameda, Calif.

We have referred your name to the manufacturers of these creams.—Ed.

FOR EVERY NEED—
"Victory" Safety Caps
Approved Hair Protection

(At Left) Style No. 51/GN—cool comfortable light weight mesh — light in weight, it eliminates all complaints. Colors — Navy, Brown or White.

(At Right) Style No. 51/FB — Light weight; close weave — keeps dust out—for all around plant use. Navy blue color only.

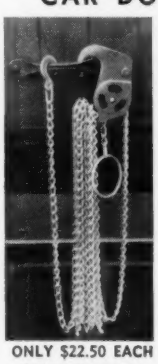
All "VICTORY" CAPS are washable and adjustable to all head sizes. Wide Snood back covers the hair completely. An unusual Cap that meets with instant approval.

Write today for illustrated folder and prices.

V. E. Kennedy Company
5004 W. Burleigh St.
MILWAUKEE 10, WIS.

SAFER—FASTER BETTER way to open balky box car doors!

MONARCH ONE MAN CAR DOOR OPENER



ONLY $22.50 EACH
F.O.B. Bowerston

One man can open the most binding, balky box car door with the Monarch Car Door Opener. Get greater safety . . . speed loading and unloading schedules . . . order an ample supply to fill your needs today!

* No strained muscles. No slips or falls. No broken arms, legs or mashed fingers. No fatalities. No time wasted. No "gangs" needed. No time loss.

Write for free descriptive literature.

MINING SAFETY DEVICE Co.
Dept. OH-1, Bowerston, O.

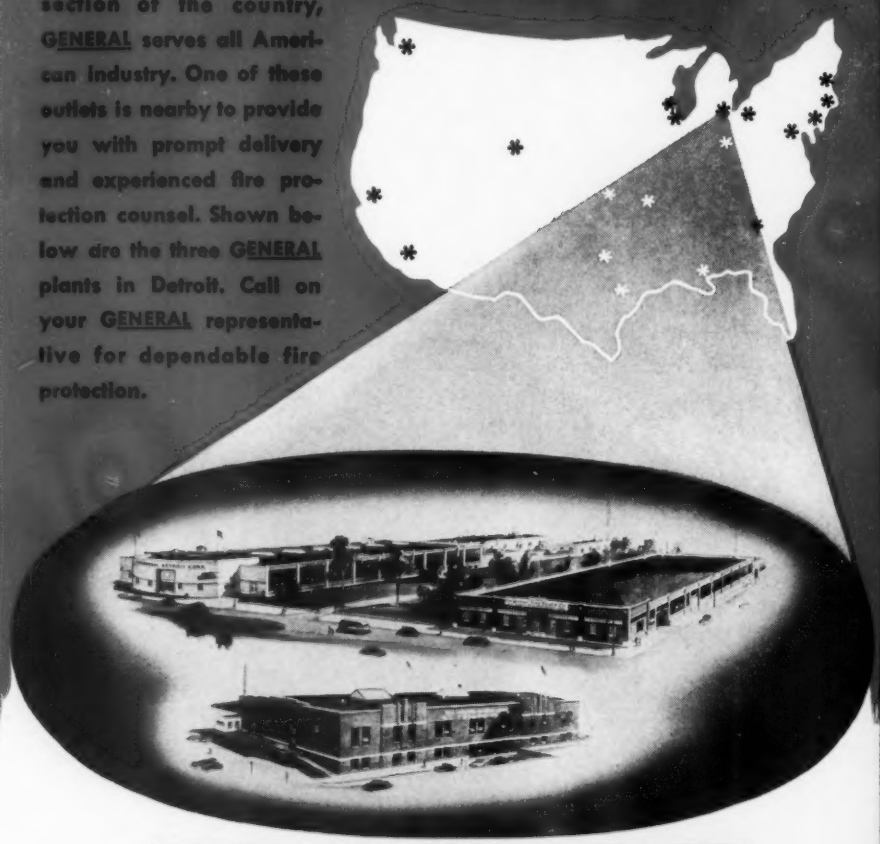
FIRE PROTECTION FOR INDUSTRY

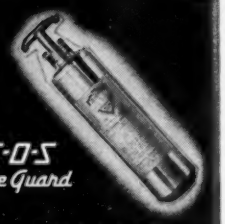
A SECTION IN WHICH ARE PRESENTED THE VARIED SPECIALIZED PROBLEMS AND SOLUTIONS TO FIRE FIGHTING CONTROL AND PROTECTION IN INDUSTRY

NATIONAL SERVICE

20 GENERAL Branches and Warehouses To Serve You...

Through its branch offices and distributors in every section of the country, GENERAL serves all American industry. One of these outlets is nearby to provide you with prompt delivery and experienced fire protection counsel. Shown below are the three GENERAL plants in Detroit. Call on your GENERAL representative for dependable fire protection.





S-O-S Fire Guard

S. O. S. FIRE GUARD Vaporizing Liquid Extinguisher—America's great utility fire fighter. Effective on oil, electrical, grease, and gasoline fires. Will not freeze at 48° below zero. 1 qt. and 1½ qt. sizes.

CD SnoFog

CD-SNO FOG Carbon Dioxide Extinguisher. Kills fire instantly, yet cannot damage equipment, premises, or personnel. Effective on electrical, oil, and gasoline fires. Sizes 2 to 100 lbs.

Red Star

RED STAR Soda Acid Extinguisher. Releases strong stream of water under chemical pressure. Immediately effective on wood, paper, or textile fires.

THE GENERAL DETROIT CORP.

Manufacturers of Fire Extinguishers
Motor Fire Apparatus and Allied Equipment
2270 E. JEFFERSON • DETROIT 7, MICHIGAN
NEW YORK • PHILADELPHIA • ATLANTA • CHICAGO • DALLAS
West Coast Affiliate: The General Pacific Corp.
Los Angeles San Francisco Seattle
Distributors in Principal Cities

IF IT'S GENERAL IT'S DEPENDABLE

Floafome

FLOAFOME Foam Type Extinguisher. Smothers fire under a blanket of foam. 2½ gallon size produces 22 gallons of foam. For use on wood, paper, textile, oil, and gasoline fires.

Protector

ALASKAN and PROTECTOR Pump Type Extinguishers. For wood, paper, or textile fires. Range is 45 feet. Non-freeze charge protects at 48° below zero. ALASKAN—2½ gallons; PROTECTOR—5 gallons.

Pacemaker

PACEMAKER Knapsack Type Extinguisher. Can be strapped on back and operated from that position. Telescopic pump nozzle leaves both hands free for fighting fire. Ideal for outdoor fires.

Industrial Fire Picture of the Month

Material and equipment worth well over a million dollars were saved for the Standard Oil Company at Richmond, Calif., recently, when men of the efficient plant fire department made a heroic stand atop a tank of flammable oil (extreme upper right of picture). They climbed up in order to pour fire-fighting chemicals on a blaze which destroy the adjacent building and which accounted for damage totaling $300,000 before it was brought under control. The fire started in a dewaxing unit in the demolished building, but the flames, which at one point shot 150 feet into the air and burned metal and wood alike, were brought under control by the efficient work of the plant forces without help from the public fire department.

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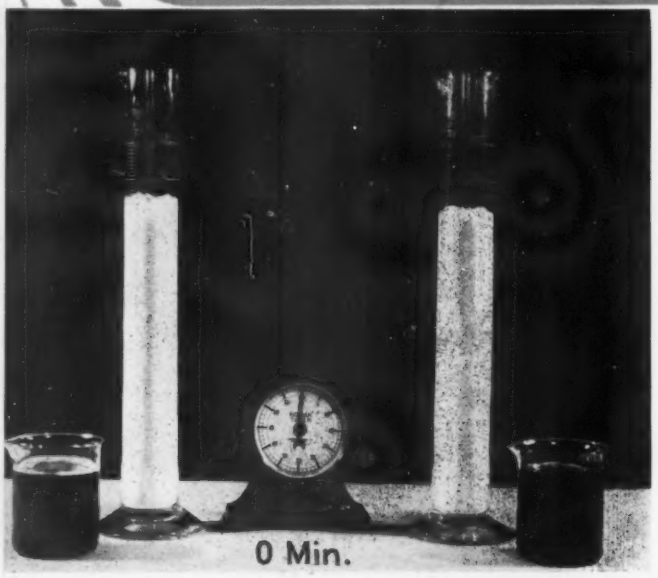
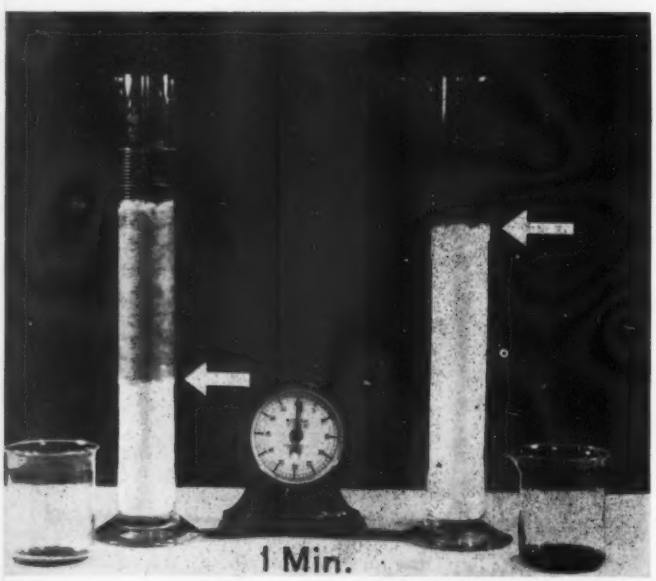
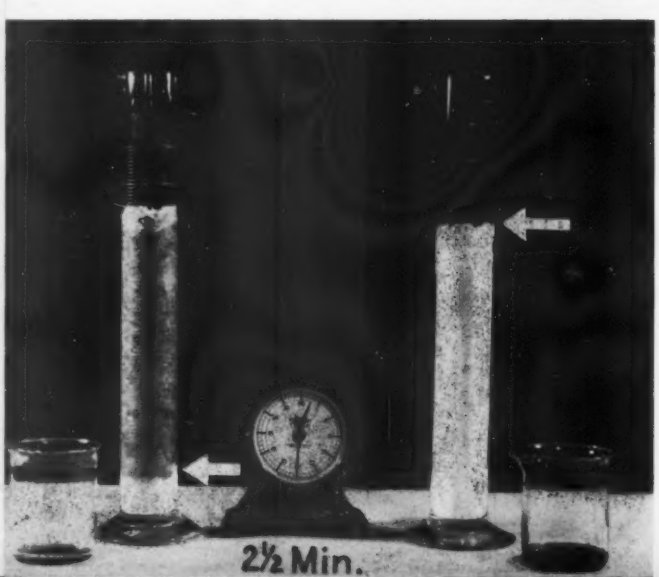
HAZARDS







"Wetter" Water EXTINGUISHES FIRES QUICKER

The wetting efficiency of water can be improved considerably.

By N. J. THOMPSON
Director, Factory Mutual Laboratories

I THINK for the most of us our earliest recollection of of an additive wetting agent in water is ordinary soap. Over a long period of years other fairly effective wetting agents were developed, among which I might mention sodium metasilicate, tri-sodium phosphate, and tri-ethanolamine. In recent years, particularly within the last ten or fifteen years, there has been much research and development to produce even more effective wetting agents.

Wetting agents may play an important part in the extinguishing of fires in certain flammable liquids by the formation of emulsions which are primarily minute drops of one liquid surrounded by a film of another liquid. Probably the commonest emulsion, familiar to us all from birth, is milk, which consists of extremely fine droplets of butter fat surrounded by a watery solution.

Benzol is one example of a flammable liquid which defies emulsification with water and which once on fire is difficult to extinguish by means of water spray. It has been found that sodium dodecylsulfate dissolved in water makes a satisfactory wetting agent for benzol so that an "oil-in-water" emulsion can be formed.

The theory has been developed that any compound (and we are thinking primarily of liquids) is subject to interior electrical forces which cause the molecules of the compound to attract one another. The net effect of these interior attractive forces is to produce the most compact shape, which is spherical, and to oppose any external force which would change the spherical shape or extend the surface. This characteristic of a liquid is known as surface tension; but more properly, the surface tension is defined as the force required to overcome these surface forces which are always acting to keep the surface area to a minimum.

(*Turn to page* 45)

Three stages in the demonstration of wetter water action on raw cotton: At the start, a wetting agent was added to only one of two beakers of colored water, the one on the left. One minute after the liquids were poured simultaneously into the graduates, the wetter water has soaked over half the cotton, and after two and one-half minutes has penetrated 8½ inches while the untreated water shows only ¼-inch penetration.

Eight persons were killed and 15 seriously injured at the Azusa, Calif., plant of the Aerojet Engineering Corp. which remained nothing but a shambles following a recent explosion and fire. Cause of the unestimated damage was believed to be a spark from a powerful electric motor used to mix liquid propellant.

The 3 E's of Fire PREVENTION and PROTECTION

ENGINEERING
EDUCATION
ENFORCEMENT

By WILLIAM F. O'CONNER
Professor of Safety Engineering
New York University

PART III

IN THE field of chemical processes there is a trend toward handling larger quantities of flammable gases and liquids under pressure and under increasingly higher pressure than ever before. Many processes in common operation today run between 500 and 1500 pounds per square inch.

Synthetic ammonia plants have been operating for years at 15 thousand pounds per inch, and some of the engineers working on the development of new processes report they are using 30 and 40 thousand pounds per square inch. These pressures will certainly exert an effect on our thinking in connection with the safe design of the plant and the laying out of fire protection equipment.

In the opposite direction we have a trend toward low temperatures for handing these gases and liquids. We have only to go back to October 20, 1944, to the disastrous explosion of the East Ohio Gas Company in Cleveland, with the attending loss of some 150 lives and property loss of over $8,000,000.

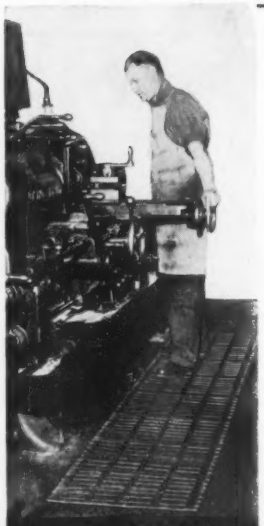
This process ran at atmospheric pressure at a temperature of minus 260 degrees Fahrenheit. The fire and explosion was thought to have been caused by the failure of a new type steel alloy, which was supposed to be satisfactory for low temperature operation. Apparently, not enough experimental or development work was done on this type alloy prior to its recommendation. There is also some question as to whether the design of the holder was in accordance with good engineering practice. This catastrophe has had two effects:

1. It has retarded considerably the use of low temperature-low pressure method of storing liquified petroleum gases.

2. It has had a sobering and stimulating effect on the development of new processes and new metals to be used for handling liquified petroleum gases.

Isolate Plants

In the first place, aroused public opinion is against locating plants using similar processes within city or town boundaries. Good engineering tells us that because of the flexibility, simplicity and great economic



The ONLY Successful OIL and GREASE RESISTANT MATTING

Neo-Cord Counter-Tred

Contains no rubber

Made with Dupont Neoprene

TUF-TRED TIRE FABRIC MATTING

A superior, long-wearing mat for promoting safety and providing comfort. Beveled nosing on all sides. For use around machinery, on ramps, wet floors, and in shower and locker rooms. 5/8" thick, up to 6' wide, any length.

AMERICAN COUNTER-TRED MATTING

A tough, durable, rubber and cord matting that affords safety in wet or slippery areas. Ridged bottom affords aeration and drainage. Easily handled for cleaning. Keeps the feet dry. 3/8" thick, 24" wide, any length.

AMERIFLEX HARDWOOD LINK MATTING

Links are held on galvanized steel springwire framework. Lies flat. Follows contour of the floor. Beveled edges. Can be rolled or folded.

"WALRUS-HIDE" ROLL RUBBER MATTING

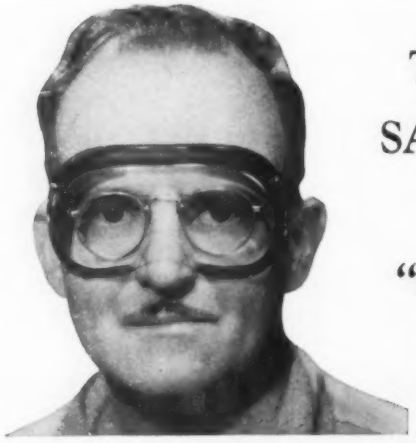
36" wide, 1/8" thick, approx. 50 yards long.

Write for prices and folder, "A Mat For Every Purpose," for promoting safety, providing comfort, reducing fatigue and furthering sanitation.

AMERICAN MAT CORPORATION

"America's Largest Matting Specialists"

1751 Adams Street Toledo 2, Ohio



THE NEW SAF-I-SHIELD of "OPTILITE" PLASTIC

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advantages to low pressure storage it should not be abandoned. Every effort should be made to properly locate future plants and design them so that the fire risk can be segregated or confined.

On a parallel matter, several municipalities throughout the country, in ill advised haste, are adopting ordinances which prohibit transportation within their municipal limits, of liquified petroleum gases. There are definite industrial and economic advantages in being able to ship liquified gases in tank trucks from one plant to another, and it is up to the designers of these tank trucks, the operators of these tank trucks, and the fire protection people, to see that these operations are further developed and perfected without any handicaps to industrial progress and at the same time, without endangering the life of any individual along the route of these trucks.

The Toxic Factor

Another important factor that requires our attention now, and will require it increasingly so in the future, is the use on a large scale of highly toxic substances. Many of these will be produced, shipped and utilized in ever increasing quantities. I have in mind acrylonitrile that is used to produce oil and gasoline resistent synthetic rubber and also, hydrogen cyanide, a very poisonous gas.

In spite of the extreme toxicity of hydrogen cyanide, it is a very important and useful substance for synthetic organic work. It combines quite readily with reagents to give many new and interesting compounds. It would be a shame to restrict or prohibit the use of this material because when properly handled, it can produce many compounds such as plastics, dyes, medicinals and insecticides which are most beneficial to mankind.

Many new plastics have been developed which are combustible and work is under way by several firms to render these non-combustible. Many of the new textiles and fabrics in the future can have their utility increased if new and better ways are found to cut down their flammability, perhaps, even going so far as to make them flame-proof. *(To be continued)*

WETTER WATER

(*Continued from page* 42)

the sodium bicarbonate constituent of the extinguisher solution.

The simplest method of application would be in the form of a previously made-up solution, such as in a 2½- or 5-gallon water type portable extinguisher, in a 500-gal. fire department pumper tank, or in a large elevated gravity tank. Another method of application, particularly adapted to portable pumping equipment, would be by the use of a solution proportioning device in which a stream of water would automatically pick up and mix with it the right proportion of a concentrated solution of the wetting agent.

A further variation of the same general idea would be a proportioner which would pick up the wetting agent in powder form so as to mix the powder thoroughly with the water and allow solution to take place in the apparatus or hose stream. Many commercial wetting agents, while quite soluble, do not dissolve sufficiently rapidly to lend themselves well to this solution method.

A method of applying wetting agents which has been suggested for certain predetermined hazards would be to spray the hazard, such as a large pulp wood pile, with a solution of the wetting agent with the idea that if there should be a fire subsequently, ordinary water can be applied in the usual manner, but with the difference that the presence of residual wetting agent on the wood will permit rapid solution and wetting to a far more favorable degree. It would appear in most cases that such a method would be restricted to rather critical circumstances where an expense of this preapplication would be justified.

Wetting agents or so-called surface-active agents tend to oppose the normal mutually attractive forces at the surface so that a liquid, for example, can easily extend itself to cover small particles of other substances or to penetrate into cracks and crevices. As a familiar example of the wetting action of water, it is relatively easy to wet a plane surface of an absolutely clean substance, but if the substance is covered with dust, wetting becomes difficult and the water stands on the surface in small globules.

Condensed moisture in the form of dew will stand in this manner on foliage, but after dust particles have been washed off by a hard or continued rain, the globules disappear and the surface is evenly wetted. There is less extension of the surface of a liquid in wetting an absolutely flat surface than in surrounding small particles such as dust particles. On the other hand, if the surface tension is reduced by the addition of the proper wetting agent, the water will surround or wet these particles very easily and even creep in under films of oil on solid objects.

Unquestionably, any marked improvement which can be made in the effectiveness of water for fire fighting would be a considerable contribution to our effort in the reduction of property damage by fire. The most promising field would appear to be for some materials which are very difficult to wet with ordinary water.

(*To be continued*)

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A Small Fire Grows into a Big Program

Investigation of a fire brought to light the need for a better fire protection plan.

By CARL KOHLER
Safety Director
The General Industries Company
Elyria, Ohio

Most of plant fire protection men are also volunteer community firemen and know the value of putting fire-hose away in good condition.

FIRE in a lint removal duct of the General Industries plant at Elyria, Ohio, brought management's attention to a laxity in supposedly complete fire protection measures.

It was not a case of disregard for fire protection. All buildings are equipped with sprinkler systems. Two yard hydrants are connected into the city water supply line. A 50,000 gallon iron tank and a 90,000 gallon pond constitute an auxiliary water supply which can be introduced into the city line, to furnish water to sprinklers or hydrants, through a 750 g.p.m. steam operated fire pump. An ample number of portable fire extinguishers are distributed throughout the plant.

However, management wanted to know why fire occurred in this duct. Investigation disclosed that the lint and dust removal system to which this duct was connected had been installed by a person unacquainted with the possible fire hazards. Progressive investigations revealed that other phases of the fire protection program had been overshadowed by other matters.

An immediate study of all duct systems was instigated and those ducts having inadequate facilities for cleaning or fire fighting, or with either improper joining or location, were revamped to conform to accepted practice.

Plans Drawn

In order to create more interest and acquaint more people who would be responsible for fire protection, a plan drawing of all departments was made. This plan shows the location and types of portable fire extinguishers, sprinkler control valves, and exits. The plan includes a complete layout of the company property.

The elimination of possible confusion under the strain of emergency was then accomplished by painting sprinkler valves and signs in corresponding colors. Main control valves in black, individual building valves in red, and drain valves in green now present an arrangement which is quickly and easily recognized.

Check Water Supplies

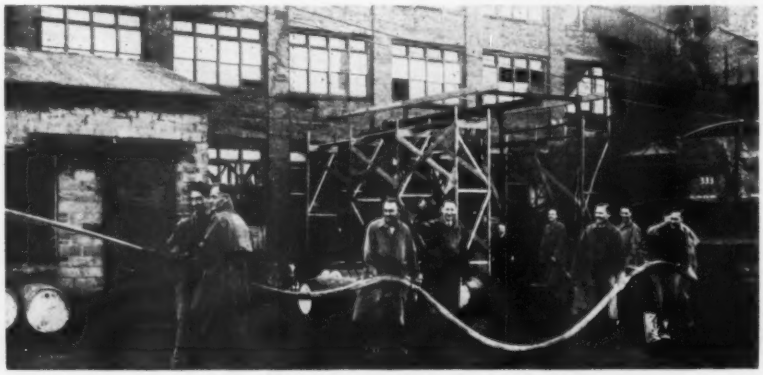
Cooperating with the company, the local City Fire Chief makes practice runs to the plant so that each maneuver necessary to complete a hydrant to pumper hook-up is clearly worked out.

The maintenance engineer makes a regular inspection of all equipment and takes flow and pressure readings on water supplies every 30 days. The plant is serviced by an insurance company inspector every two months.

As most of the members of the plant fire brigade are volunteer firemen under the local fire protection system, it is felt that competent personnel are prepared to cope with any fire emergency.

The small fire in a lint duct led to an over-all recognition of the importance of adequate fire protection measures. If management of other plants would recognize the significance of such indicators, industrial fire losses would soon be reduced.

The fire brigade at General Industries gets a frequent workout on practice runs with full water pressure and all the trimmings.



Fire Retardants Save Lives

THE general qualification of a fire retardant is that it slow down the rate of combustion of a flammable material, approaching as close as possible to the point at which the material is incapable of supporting combustion. Flame-proof cotton fabrics, for example, will be charred at the point of application of flames but will neither blaze nor experience any afterglow.

Fire retardants are usually designed for use on any fabric except rayon of the acetate type, on paper and paper products, non-mineral insulation and on all other cellulose products with the exception of wood. The most useful industrial application is on workmen's clothing in fire-exposed employment, especially since tests conducted by the DuPont laboratories indicate that certain fire retardant chemicals have no skin irritant action.

Other applications include the treatment of office drapes, dispensary equipment such as blankets, pile fabrics and mattress tickings, overstuffed furniture, fibrous insulation products, building paper, composition wallboard and similar materials.

Three different methods may be employed in the application of fire retardants made by DuPont—immersion, spray or brush. The immersion method, however, is preferred wherever practicable since it provides a more uniform treatment than either the spray or brush treatments. Many laundries now have a flame-proofed garment service.

In any of the three methods of treatment, the amount of fire retardant retained by the material should be no less than 10 per cent by weight. For example, material weighing 100 pounds dry before treating should, after treatment and drying, weigh at least 110 pounds. A simple method of checking the retention of the fire retardant is to pin sample swatches to the goods being treated; drying and testing these ahead of the main load.

It doesn't look safe, but it is. Flameproofed fabrics have arrived, now that ammonium sulfamate, a fire retardant, can be produced economically. The chemical solution is used as a dip for curtains, overall cloth, etc., to prevent burning and yet permit the material to retain the same appearance and "feel". (DuPont Photo.)

To provide a satisfactory finish to treated material, mangles and presses should be operated at the lowest practical steam pressure.

Fire retardant solutions should not be used in equipment made of copper, brass, bronze or galvanized iron because these metals will corrode. Where use of these metals is unavoidable, flush equipment with clear water immediately after use. Equipment of ordinary black iron, lead, stainless steel, ceramic ware or wood is recommended when applying fire retardants. Keep solution out of eyes, mouth and nose. Avoid undue contact of strong solutions with skin.

Many treated fabrics will lose some degree of tear and tensile strength when exposed to temperatures over 180° F. or on prolonged exposure to strong sunlight. Fabrics treated with many fire retardant solutions usually are not affected by ordinary dry-cleaning, but should be re-treated after laundering.

Flameproofing of overalls for industry is fast becoming a standard life-saving laundry service in and around large cities, and here laundrymen give this service the supreme test—with an acetylene torch. After each washing the flameproof treatment is repeated, insuring clothing that may char but can't burn. (DuPont Photo.)

Know Your Extinguisher Maintenance . . .

TO maintain hand fire extinguishers in good working order, plant protection personnel must see that they are inspected frequently, refilled at once after any use, and given a complete servicing at least once a year. If this procedure is not followed, the extinguishers may not be ready for quick action when needed.

Listed below are various types of extinguishers in common use with brief steps to be taken in servicing each. This servicing may be a continuous process throughout the year delegated to one or two experienced men who can also handle the recharging. In case many extinguishers are involved, a competent supervisor can train a group of men to do the job at one time, checking over each reassembled unit himself and making sure no part of the plant is short of fire protection during the process.

DRY CHEMICAL

Approved dry compound extinguishers are usually made in sizes having a nominal capacity of 12 and 20 pounds of dry chemical. The agent used is generally a treated bicarbonate of soda in dry powder form with a cartridge of carbon dioxide for expelling it. Used most effectively on Class B fires involving flammable liquids, greases, etc., in small quantities as in floor spillage, the pressure discharge permits the operator a safe stance away from the heat of the flames.

Extinguishers are designed to be carried to the fire by the top handle and, to be used, must be operated in accordance with instructions which are prominent on the extinguisher. When the pressure is allowed to enter the chemical cylinder the chemical may be expelled upon opening the shut-off nozzle. This action expels a cloud of the chemical and gas through the nozzle. The discharge has a range of approximately 8 to 12 feet horizontally.

Extinguishers of this type do not need to be protected against freezing. Here are one user's rules:

Extinguishers shall be kept full with the specified weight of chemical at all times. Cartridges shall be kept fully charged at all times. Reweighing is the only method of determining whether or not the cartridge is fully charged. Extinguishers shall be refilled immediately after use even though only partly discharged. Before recharging, hose shall be cleared of all chemical.

Caution: Do not use water for any purpose in extinguishers of this type.

Extinguishers shall be examined at regular intervals — several times a year — to make sure that they have not been tampered with nor removed from their designated places; to detect any injuries; to see that the orifice of the hose nozzle is not clogged; also to see that they are not empty.

At least once yearly, the extinguishers and all their parts (including gasket and hose) shall be examined for deterioration or injuries due to misuse and the orifices of the hose nozzles examined to see that they are not clogged. These examinations should make sure that the chemical is in freely running powdery condition, that the hose has not been cut or otherwise deteriorated and that threaded connections are tight. The hose must be free from chemical or other obstruction. Extinguishers or parts which are not in good condition shall be replaced.

SODA ACID EXTINGUISHERS

Be sure the nozzle opening is clear; then invert the extinguisher and discharge the contents. Unscrew the head and examine the gasket, which should be replaced if it is damaged or badly worn.

Remove the cage containing the acid bottle, putting aside the stopple for later replacement. Make sure all the extinguisher parts are kept together so that they may later be returned to their respective units.

Rinse the extinguisher shell thoroughly with warm water, draining it through the hose. Open clogged holes in the hose strainer with a piece of wire. Replace the hose and nozzle, if badly worn or damaged.

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Dissolve the dry chemical in lukewarm water, according to directions on the recharge package. Pour the solution into the extinguisher shell, and bring to the filling mark by adding water. Remove the cork from the new acid bottle and replace it with the stopple from the old bottle.

Replace bottle and cage in the extinguisher neck. (If any acid spills on the skin or clothing, wash it off with water.) Rub a little vaseline on the shell threads and replace the head, using only hand power. Be sure that the gasket fits snugly against the shell neck. Recharge annually, if not used during the year and recharge after use. Tag extinguishers to show recharge date.

Caution: If the extinguisher looks badly dented, or the seams appear weakened, do not discharge. Instead, remove the head and pour out the contents. Return to the manufacturer or his agent for repair.

(To be continued)

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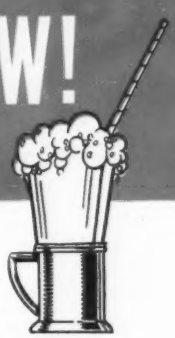

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